

# PATENT ABSTRACTS OF JAPAN

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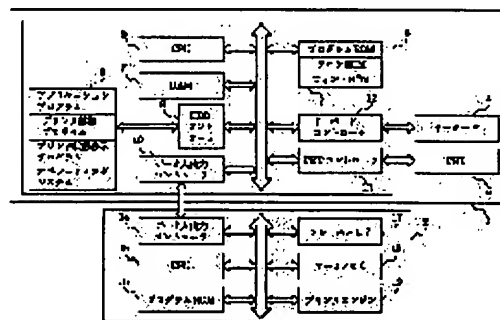
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## (54) INFORMATION PROCESSOR, PRINTER CONTROL METHOD AND STORAGE MEDIUM

(57)Abstract:

**PROBLEM TO BE SOLVED:** To reduce a time difference between the state change of a printer and state information of the printer, which is displayed in the information processor of a host computer by controlling a time interval for transmitting the request command of status data to the printer in accordance with the recognized status of the printer.

**SOLUTION:** The printer 2 receives the command for requesting the transmission of a printer state from the host computer 1 and transmits printer state data (status) to the host computer 1 in accordance with the received command. The data input/output controller 10 of the host computer 1 transmits a status information acquirement command to the printer 2 and receives status information for showing the operation state and the error state of the printer 2, which are transferred from the printer 2. CPU 6 of the host computer 1 controls the time interval for issuing the status information acquirement command to the printer 2 in accordance with the state of the printer from status information.



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**CLAIMS**

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[Claim(s)]

[Claim 1] The information processor characterized by having a recognition means to recognize the status of said printer based on the status data which are the information processor which controls a printer through a bidirectional interface, and were acquired from said printer, and the control means which controls the time interval which transmits the demand command of said status data to said printer according to the status of said printer recognized with said recognition means.

[Claim 2] It is the information processor according to claim 1 characterized by said control means shortening said transmitting time interval when said status data show under printer actuation.

[Claim 3] It is the information processor according to claim 1 characterized by said control means lengthening said transmitting time interval when said status data show under printer standby.

[Claim 4] It is the information processor according to claim 1 characterized by said control means shortening said transmitting time interval when said status data show a printer error.

[Claim 5] It is the information processor according to claim 1 characterized by said control means shortening said transmitting time interval most when said status data show under a printer error and printer actuation.

[Claim 6] It is the information processor according to claim 1 characterized by said control means lengthening said transmitting time interval most when said status data show under printer normal and printer standby.

[Claim 7] Said information processor is an information processor according to claim 1 characterized by having a receiving means for receiving said status data from said printer.

[Claim 8] Said information processor is an information processor according to claim 1 characterized by having a transmitting means for transmitting the demand command of said status data to said printer.

[Claim 9] Said information processor is an information processor according to claim 1 characterized by being a host computer.

[Claim 10] The printer control approach characterized by to have the recognition process which recognizes the status of said printer based on the status data which are the printer control approach in the information processor which controls a printer through a bidirectional interface, and acquired from said printer, and the control process which control the time interval which transmits the demand command of said status data to said printer according to the status of said printer recognized at said recognition process.

[Claim 11] It is the printer control approach according to claim 10 characterized by said control process shortening said transmitting time interval when said status data show under printer actuation.

[Claim 12] It is the printer control approach according to claim 10 characterized by said control process lengthening said transmitting time interval when said status data show under printer standby.

[Claim 13] It is the printer control approach according to claim 10 characterized by said control process shortening said transmitting time interval when said status data show a printer error.

[Claim 14] It is the printer control approach according to claim 10 characterized by said control process shortening said transmitting time interval most when said status data show under a printer error and printer actuation.

[Claim 15] It is the printer control approach according to claim 10 characterized by said control process lengthening said transmitting time interval most when said status data show under printer normal and printer standby.

[Claim 16] Said information processor is the printer control approach according to claim 10 characterized by receiving said status data from said printer with a receiving means.

[Claim 17] Said information processor is the printer control approach according to claim 10 characterized by transmitting the demand command of said status data to said printer with a transmitting means.

[Claim 18] Said information processor is the printer control approach according to claim 10 characterized by being a host computer.

[Claim 19] The storage characterized by to memorize the control module of the control process which controls the time interval which transmits the demand command of said status data to said printer according to the status of said printer which has recognized by the recognition module and said recognition module of the recognition process which recognizes the status of said printer based on the status data which are the storage which memorized the control program used with the information processor which controls a printer through a bidirectional interface, and acquired from said printer.

[Claim 20] It is the storage according to claim 19 characterized by said control module shortening said transmitting time interval when said status data show under printer actuation.

[Claim 21] It is the storage according to claim 19 characterized by said control module lengthening said transmitting time interval when said status data show under printer standby.

[Claim 22] It is the storage according to claim 19 characterized by said control module shortening said transmitting time interval when said status data show a printer error.

[Claim 23] It is the storage according to claim 19 characterized by said control module shortening said transmitting time interval most when said status data show under a printer error and printer actuation.

[Claim 24] It is the storage according to claim 19 characterized by said control module lengthening said transmitting time interval most when said status data show under printer normal and printer standby.

[Claim 25] Said information processor is a storage according to claim 19 characterized by receiving said status data from said printer with a receiving means.

[Claim 26] Said information processor is a storage according to claim 19 characterized by transmitting the demand command of said status data to said printer with a transmitting means.

[Claim 27] Said information processor is a storage according to claim 19 characterized by being a host computer.

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DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the storage which memorized the control program used with the information processor which controls a printer through a bidirectional interface, the printer control approach, and the information processor concerned.

[0002]

[Description of the Prior Art] In case image data is printed using the printer connected to the former, for example, a host computer, a host computer displays the received information on the display of a host computer etc. while receiving error information, such as a situation of a printer of operation, and print sheet plugging or an ink toner piece, etc. from a printer. This notifies a user of the condition of a printer.

[0003] Moreover, when the printer omits printing actuation, a host computer displays the received information on the display of a host computer etc. while receiving information, such as a situation of the online/off-line of a printer, and a closing motion situation of covering of a printer, from a printer.

[0004] As mentioned above, in order to acquire the status information of a printer, a host computer changes the status information which transmits the command it is directed that transmits status information to a printer to a printer, and is transmitted from the printer which received the command into the form of an alphabetic character, a graphic form, etc. which can be displayed, and shows it on the display of a host computer etc. In this case, directions of the status information transmission to a printer are usually performed for every fixed time interval set up beforehand from a host computer.

[0005]

[Problem(s) to be Solved by the Invention] However, there were the following problems in information processors, such as the conventional host computer mentioned above. namely, a printer -- printing -- a host computer also in the situation that it is working and the condition of the printer concerned changes for a short time, in order not to require the status information of a printer for every fixed time interval set up beforehand When the time interval set up beforehand was too long as compared with spacing of the change of state of a printer, the problem that time difference occurred was between the situations of the printer displayed on the display of the actual situation of a printer, and a host computer etc.

[0006] Moreover, even when the time interval as which a host computer requires status information from a printer is set up short beforehand that the time difference mentioned above should be avoided, the printer omits printing actuation and there are comparatively few changes of state of a printer, a host computer must process the status information of a printer with a short time interval. For this reason, the host computer and the printer had the problem that effectiveness was bad.

[0007] While this invention is made in view of the point mentioned above and being able to recognize the status information of a printer A suitable time interval to transmit the command which requires status information to a printer can be chosen from two or more time intervals beforehand set up according to the status information of a printer. Furthermore, while time difference with the status information of the printer displayed with the change of state and host

computer of a printer is mitigable. It aims at offering the storage which memorized the control program for performing the information processor and the printer control approach aggravation of the performance of a host computer and a printer is avoidable, and the actuation concerned.

[0008]

[Means for Solving the Problem] In order to attain the above-mentioned purpose, the information processor of the invention in this application is an information processor which controls a printer through a bidirectional interface, and has a recognition means recognize the status of said printer based on the status data acquired from said printer, and the control means which controls the time interval which transmits the demand command of said status data to said printer according to the status of said printer recognized with said recognition means.

[0009] In order to attain the above-mentioned purpose, the printer control approach of the invention in this application is the printer control approach in the information processor which controls a printer through a bidirectional interface, and has the recognition process which recognizes the status of said printer based on the status data acquired from said printer, and the control process which control the time interval which transmits the demand command of said status data to said printer according to the status of said printer recognized at said recognition process.

[0010] In order to attain the above-mentioned purpose, the storage of the invention in this application. It is the storage which memorized the control program used with the information processor which controls a printer through a bidirectional interface. The recognition module of the recognition process which recognizes the status of said printer based on the status data acquired from said printer. According to the status of said printer recognized by said recognition module, the control module of the control process which controls the time interval which transmits the demand command of said status data to said printer is memorized.

[0011]

[Embodiment of the Invention] Hereafter, the gestalt of operation of the 1st of this invention and the gestalt of the 2nd operation are explained with reference to a drawing.

[0012] (1) Explain gestalt point \*\* of the 1st operation, and the structure of a system concerning the gestalt of the 1st operation based on drawing 1. The profile configuration of this system is carried out from the host computer 1 and the printer 2. Said host computer 1 consists of a body 3 of a host computer, a keyboard 4, and CRT5, and the body 3 of a host computer is further equipped with CPU6, RAM7, a hard disk 8, the hard disk (HDD) controller 9, the data input/output controller 10, ROM11, the keyboard controller 12, and CRT controller 13. Moreover, said printer 2 is equipped with the data input/output controller 14, CPU15, a program ROM 16 and a frame memory 17, the work-piece memory 18, and the printer engine 19 as shown in drawing 8.

[0013] Drawing 8 is the external view showing the configuration of printer engine 19, for example, shows the case of an ink jet printer engine.

[0014] In drawing, the carriage HC engaged to the spiral slot 5004 of a leading screw 5005 which is interlocked with the forward inverse rotation of a drive motor 5013, and is rotated through the driving force transfer gears 5011 and 5009 has a pin (not shown), and both-way migration is carried out in an arrow head a and the direction of b through a guide rail 5003. The ink jet cartridge IJC equipped with the ink tank IT and the ink jet head IJH is carried in this carriage HC. 5002 is a paper bail plate and presses paper to a platen 5000 covering the carriage migration direction.

[0015] 5007 and 5008 are photo couplers, check existence [ in this region of the lever 5006 of

carriage ], and function as a home-position detection means for performing a hand-of-cut switch of a drive motor 5013 etc. The member which directs the cap member 5022 to which 5016 caps the whole surface of a recording head, and 5015 are suction means to attract the inside of this cap, and perform suction recovery of a recording head through the opening 5023 in a cap. 5017 is a cleaning blade and becomes movable by the member 5019 at a cross direction. 5018 is a body support plate and supports the above-mentioned cleaning blade 5017 and a member 5019. It is a lever for starting suction of suction recovery, and it moves with migration of the cam 5020 which engages with carriage, and, as for 5012, migration control of the driving force from a drive motor 5013 is carried out with a means of communication with a well-known clutch switch etc.

[0016] When carriage comes to a home-position side field, it is constituted so that a request can be processed according to an operation of a leading screw 5005 in those correspondence locations, but these capping, cleaning, and suction recovery should just be constituted so that request actuation may be performed to well-known timing.

[0017] If the configuration of each part shown in drawing 1 is explained in full detail, the host computer 1 formed as an information processor in a system It is based on the operating system in a hard disk 8. With an application program etc. The function which outputs image data for the data with which the generated alphabetic character / graphic form / image are intermingled to a printer 2 through the printer control program in a hard disk 8 (printer driver), It has the function which displays the status information of a printer 2 on CRT5 through CRT controller 13 through a printer status-display program (status monitor) based on the operating system in a hard disk 8 (OS).

[0018] In addition, there is a printer driver for sending a Page Description Language to the printer driver and printer 2 for sending an image data to a printer 2 among the printer drivers.

[0019] The keyboard 3 is equipped with various keys and is for inputting data. CRT5 displays various information as shown in drawing 9 or drawing 10 . In addition, a display means may not be limited to CRT, for example, other display means, such as liquid crystal, are sufficient as it. CPU6 controls the body 3 of a host computer based on various programs. RAM7 is write-in read-out memory at any time, and all the programs that operate in the host computer 1 interior are loaded, or it is used as work-piece memory working [ a program ]. The data which need a hard disk 8 in case the various programs other than various programs, such as an application program, a printer control program (printer driver), and a printer status-display program (status monitor), operate are stored. The hard disk controller 9 performs read-out / write-in processing of data or a program stored in the hard disk 8.

[0020] The data input/output controller 10 A bidirectional data communication interface By (for example, the BAISENTORO interface of IEEE 1284 specification) connecting with the printer 2, and performing transmission and reception of the command and data which are later mentioned between printers 2 The command for printer control and data which were generated with the above-mentioned printer control program are transmitted to a printer 2 side, or data, such as the status conversely sent from the printer 2 side, are received, and it holds temporarily to a non-illustrated internal memory. ROM11 is a read-only memory and consists of fonts ROM which store the font data used in case various programs are performed on a host computer 1 or various information is displayed on [ other than the data ROM which store the program ROM which stores the program for various basic actuation of controlling various controllers, and data ] CRT5. The keyboard controller 12 controls the key input from the keyboard 4 connected to the host computer 1. CRT controller 13 controls the display to CRT5 for a display.

[0021] A printer 2 transmits printer condition data (status) to a host computer 1 according to the received command while receiving the command which records the image data which received on a record form, and requires transmission of a printer condition from a host computer 1 while receiving the image data transmitted from the host computer 1. The data input/output controller 14 receives the image data transmitted from the host computer 1 to the printer 2, or transmits the status from a printer 2 side to a host computer 1. CPU15 controls the body of a printer. The program for a program ROM 16 to perform a series of printer actuation on which the image data which received from the host computer 1 is made to record with printer engine 19 is stored.

[0022] In addition, when printer language like a Page Description Language is received from a host computer 1, the emulation program which analyzes the printer language concerned and generates an image data is also stored.

[0023] A frame memory 17 is the memory holding the image data which received or it was generated by the emulation program within a program ROM 16. The work-piece memory 18 is memory used in various processings of image recording including generation processing of an image data. The image which printer engine 19 records in a color the image data held to the frame memory 17 on a record form, and can be recorded with the printer engine 19 concerned is a binary record pattern.

[0024] furthermore, when the printer 2 which has the above-mentioned configuration is supporting status information acquisition commands, such as operating state of the printer 2 concerned, and an error situation, and the command concerned is received While judging the any the error has generated whether it is under delivery whether the operating state of a printer 2 is printing, and they are not, either, when the error has occurred, the error code beforehand set up corresponding to the error concerned is transmitted. The data format of the error code transmitted at the time of error generating serves as printer status information as shown in drawing 4.

[0025] With the gestalt of the 1st operation, the data input/output controller 10 of a host computer 1 While constituting a command transmitting means to transmit a status information acquisition command to a printer 2 A status information receiving means to receive the status information showing operating state, an error situation, etc. of the printer 2 transmitted from the printer 2 is constituted. CPU6 of a host computer 1 The control means which controls the time interval which publishes a status information acquisition command to a printer 2 according to the condition of a printer 2 consists of said status information.

[0026] Next, actuation of the printer status-display program (status monitor) shown in the flow chart of drawing 2 is explained.

[0027] First, CPU6 determines the initial value of the time interval to which a host computer 1 transmits a status information acquisition command to a printer 2 as 1.0 seconds, and stores the initial value concerned in the status acquisition spacing record section prepared in RAM7 of a host computer 1 (step S101). Next, CPU6 sets up a status display field on CRT5 of a host computer 1 (step S102). As shown in drawing 9 or drawing 10, the situation of operation and error situation of a printer 2 are displayed on the status display field concerned using a character string or a bitmapped image.

[0028] Next, CPU6 judges whether the user is demanding termination of a printer status-display program (step S103), and when it is judged that termination of a program is demanded, it ends a program. On the other hand, when it is judged that termination of a program is not demanded It judges whether the time amount (for example, 1 second) stored in the status acquisition spacing record section in RAM7 after CPU6 transmits a status acquisition command to a printer 2 last time passed (step S104). When it is judged that it passed, status display processing is performed



(step S105), and processing not more than step S103 is repeated. On the other hand, after transmitting a status acquisition command to a printer 2 last time, when it is judged that the time amount (2 seconds) stored in the status acquisition spacing record section in RAM7 has not passed, processing not more than step S103 is repeated.

[0029] In addition, a non-illustrated timer is started with initiation of the printer status-display program concerned. And when the status acquisition command is not transmitted last time, it judges whether the above-mentioned time amount (1 second) has passed since program initiation at step S104.

[0030] As mentioned above, it repeats and performs between step S103 and step S105 until CPU6 in the information processor concerning the gestalt of this operation has a program termination demand of a user, after ending processing of step S101 and step S103.

[0031] Next, actuation of the status display processing shown as step S105 is explained to above-mentioned drawing 2 based on the flow chart of drawing 3.

[0032] First, CPU6 of a host computer 1 transmits the status information acquisition command which a printer 2 supports to a printer 2 so that it may investigate the operating state and error situation of a printer 2 (step S201). Next, CPU6 of a host computer 1 receives and reads the status information transmitted from the printer 2 (step S202). As shown in drawing 4, the information on the operating state and error situation of a printer 2 is included in the status information concerned, and this value is used henceforth.

[0033] in addition -- the field of the operating state of drawing 4 -- under feeding -- under (LD) and printing -- under (PR) and delivery -- (EJ) -- waiting -- the error code which 2 bytes of character string showing four kinds of operating state of (NO) is stored, and is expressed with 4 bytes of printer 2 proper showing the category of error generated by the printer 2 to the field of an error situation -- or 4 bytes of code showing the error having not occurred is stored. For example, in jam generating of 1000, 1300 is stored when you have no form.

[0034] If CPU6 of a host computer 1 receives status data at the above-mentioned step S202 and stores them in the work-piece memory of RAM7, it will judge whether the status data received from the printer 2 at the above-mentioned step S202 are changing from the status data in which the condition of the printer 2 currently displayed on CRT5 of the current host computer 1 is shown (step S203). The judgment concerned is performed in order not to process modification of future status displays etc., when there is no change in the status. When it is judged that it is the same as the status data in which the condition of the printer 2 which the status data received from the printer 2 show on CRT5 of the present host computer 1 is shown, status display processing is interrupted and it shifts to step S103 of above-mentioned drawing 1.

[0035] In addition, it judges whether the status data in which the condition of the printer 2 currently displayed on CRT5 is shown are stored in the work-piece memory of RAM7, compared this status data with the received status data at step S203, and changed.

[0036] the case where the status data in which the contents which show the host computer 1 to the status data and CRT5 of the received printer 2 are shown judge that it differs -- a printer 2 -- printing -- the contents of the operating-state field of the status data received from the printer 2 judge whether a printer 2 means operating in either feeding / printing / delivery in order whether it is working or waiting (step S204).

[0037] When the contents of the operating state field express either of the (EJ(s)) during (PR) and delivery during (LD) and printing during feeding, the contents of the status acquisition spacing record section in RAM7 of a host computer 1 are changed into the value (for example, 0.5 seconds) of the set point 1 of the status acquisition spacing data shown in drawing 5 (step

S205), and it shifts to step S207. on the other hand, the contents of the operating state field are waiting -- when (NO) is expressed, the contents of the status acquisition spacing record section in RAM7 of a host computer 1 are changed into the value (for example, 2.0 seconds) of the set point 2 of the status acquisition spacing data shown in drawing 5 (step S206), and it shifts to step S207.

[0038] In addition, the field shown in drawing 5 is beforehand stored in the work-piece memory of RAM7.

[0039] Here, the value of the set point 1 of drawing 5 is set up smaller than the value of the set point 2, and when a printer 2 is working and the status of a printer 2 changes frequently, according to it, a host computer 1 acquires the status information of a printer 2 with a short time interval. Moreover, a printer 2 is waiting, and when the case where change of the status is more nearly working is not frequent, it controls not to spoil the performance of a host computer 1 and a printer 2 by lengthening the time interval to which a host computer 1 acquires status information from a printer 2.

[0040] After processing of the above-mentioned step S205 or step S206 is completed, a host computer 1 displays the contents received from the printer 2 at the above-mentioned step S202 on CRT5 (step S207). Then, it returns to step S103 of above-mentioned drawing 1. For example, if the status which received is printing, the contents shown in drawing 9 will be expressed to CRT5 as step S207. Moreover, if the status which received is waiting, the contents shown in drawing 10 will be expressed to CRT5 as step S207.

[0041] As mentioned above, according to the gestalt of the 1st operation, transmit a status information acquisition command to the printer 2 by which the host computer 1 was connected to the host computer 1 concerned, and status information is received from a printer 2. When displaying the contents on CRT5 as the operating state and error situation of a printer 2 The time interval at the time of a host computer 1 repeating a series of actuation of transmitting a status information acquisition command to a printer 2, and receiving the response (polling interval) It is based on whether actuation called feeding, printing, and delivery is performed or to be waiting by the printer 2. If the printer 2 is waiting, in order to set it as the short time interval set up beforehand if the printer 2 is working, and to set it as the long time interval set up beforehand, When a printer 2 is working and the status changes frequently It becomes possible to update a status display with a short time interval according to it, and a printer 2 is waiting. When there is comparatively little change of the status It becomes possible to control to become possible to make small the frequency which updates a status display, consequently not to spoil the performance of a host computer 1 and a printer 2.

[0042] (2) With the gestalt of implementation of the gestalt above 1st of the 2nd operation, a host computer 1 transmits a status information acquisition command to a printer 2. Although the printer 2 is performing feeding, printing, and control changed on the basis of whether actuation called delivery in the time interval which repeats a series of actuation of receiving the status information which is the response of the printer 2 to this from a printer 2 is performed The gestalt of operation of \*\*\*\* 2 in addition, when an error occurs by the printer 2 A host computer 1 transmits a status information acquisition command to a printer 2, and the time interval which repeats a series of actuation of receiving the status information which is the response is set up shorter than the case where the error has not occurred. A user enables it to cope with the error of a printer 2 promptly by updating the status display on CRT5 with a short time interval.

[0043] The system configuration concerning the gestalt of the 2nd operation is the same as the system configuration concerning the gestalt of implementation of the above 1st, and the point in

which the gestalt of the 2nd operation carries out difference to the gestalt of implementation of the above 1st is a point performed as the flow chart of drawing 6 shows the status display processing shown in the flow chart of above-mentioned drawing 2 as step S105.

[0044] In drawing 6, CPU6 of a host computer 1 transmits the status information acquisition command which a printer 2 supports to a printer 2 so that it may investigate the operating state and error situation of a printer 2 (step S301). Next, CPU6 of a host computer 1 receives and reads the status information transmitted from the printer 2 (step S302). As shown in above-mentioned drawing 4, the information on the operating state and error situation of a printer 2 is included in the status information concerned, and this value is used henceforth.

[0045] It judges whether CPU6 of a host computer 1 is changing from the stage data in which the condition of a printer 2 that the status data which are RAM7, and which were received from the printer 2 at the above-mentioned step S302 when work-piece memory storing was carried out show status data on CRT5 of the current host computer 1 at the above-mentioned step S302 is shown (step S303). The judgment concerned is performed in order not to process modification of future status displays etc., when there is no change in the status.

[0046] In addition, it judges whether the status data in which the condition of the printer 2 currently displayed on CRT5 is shown are stored in the work-piece memory of RAM7, compared this status data with the received status data at step S303, and changed.

[0047] The contents of the error situation field of the status data received from the printer 2 so that CPU6 of a host computer 1 may get to know whether a printer 2 is an error situation judge the numeric value showing the error having occurred, or the numeric value showing the error having not occurred (step S304). When it is judged that the contents of the error situation field of status data express the error of a printer 2 First, the current time of a non-illustrated timer is set as the error generating time-of-day storage region established in RAM7 of a host computer 1 (step S305). For example, while setting to the field of the set point 1 of the status acquisition spacing data which chose the first train of a status acquisition spacing table as shown in drawing 7, and showed the contents of the first line to above-mentioned drawing 5 The contents of the second line are set to the field of the set point 2 of status acquisition spacing data (step S306), and it shifts to step S309.

[0048] On the other hand, when it is judged that the contents of the error situation field of status data do not express the error of a printer 2, CPU6 of a host computer 1 First, the storage value and current time of the error generating time-of-day storage region prepared at step S305 are compared. It judges whether the convention time amount (for example, 10 seconds) memorized in the convention time amount storage region established in RAM7 of a host computer 1 from the time of day set as the error generating time-of-day storage region has passed (step S307). When it is judged that convention time amount has already passed, the second train of the status acquisition spacing table shown in above-mentioned drawing 7 is chosen, and while setting to the field of the set point 1 of the status acquisition spacing data which showed the contents of the first line to above-mentioned drawing 5, the contents of the second line are set to the field of the set point 2 of status acquisition spacing data (step S306), and it shifts to step S309. When it is judged that convention time amount has not passed yet, it shifts to the direct step S309.

[0049] In addition, when the error has not occurred once, CPU6 judges whether convention time amount has passed since the start time of a printer status-display program at step S307.

[0050] Here, the status acquisition spacing table of above-mentioned drawing 7 is a field which remembers status acquisition spacing in each case of being waiting that a printer 2 is working about each when the case where are in the status acquisition spacing table storage region

established in RAM7 of a host computer 1, and the error has occurred by the printer 2, and the error have not occurred. As status acquisition spacing memorized by the status acquisition spacing table was shown in drawing 7, if T1 (for example, 0.5 seconds), T2 (for example, 1.0 seconds), T3 (for example, 1.0 seconds), and T four (for example, 2.0 seconds), T1 shall be smaller than T2, T3 shall be smaller than T four, T1 shall be smaller than T3, and T2 shall be beforehand set up so that it may become small rather than T four.

[0051] After processing of the above-mentioned step S306, step S308, or step S307 is completed, a host computer 1 judges whether with reference to the operating state field of the status data of the printer 2 concerned received from the printer 2, the printer 2 is operating in feeding, printing, or delivery at the above-mentioned step S302, or it is standing by (step S309).

[0052] When it is judged that a printer 2 is working, the contents of the status acquisition spacing record section in RAM7 of a host computer 1 are changed into the value of the set point 1 of status acquisition spacing data (step S310), and it shifts to step S312. On the other hand, when it is judged that a printer 2 is waiting, the contents of the status acquisition spacing record section in RAM7 of a host computer 1 are changed into the value of the set point 2 of status acquisition spacing data (step S311), and it shifts to step S312.

[0053] That is, when the time interval which performs processing for updating a status display rather than the case where the error has not occurred when the error has occurred by the printer 2 becomes short and the printer 2 is performing feeding, printing, and actuation of delivery, the time interval which performs processing for updating a status display rather than the case where it is not operating will become short.

[0054] After processing of the above-mentioned step S310 or step S311 is completed, a host computer 1 displays the contents received from the printer 2 at the above-mentioned step S302 on CRT5 of a host computer 1 (step S312), and returns to step S103 of above-mentioned drawing 1 after that. For example, if the status which received is jam occurring, the contents shown in drawing 11 will be displayed on CRT5 by S312.

[0055] As mentioned above, when it is judged according to the gestalt of the 2nd operation that the error has generated a host computer 1 to the printer 2 while it judges whether the error has occurred to the printer 2 In order to set up shorter than the case where the error has not occurred the time interval at the time of repeating a series of actuation of transmitting a status information acquisition command to a printer 2, and receiving the response (polling interval), At the time of error generating of a printer 2, time amount which updates a status display can be shortened and a user can cope with the error of a printer 2 now promptly. For example, in jam generating, according to the contents of a display of drawing 11, a user can cope with it promptly at an error. Moreover, also when an error recurs immediately after an error situation is canceled temporarily, without a user performing right management to an error, in order to continue shortening the time interval which acquires status information until fixed time amount passes since the time of error generating even when the error of a printer 2 is canceled, it can urge performing a status display promptly and coping with a user at an error.

[0056] In addition, even if it applies this invention to the system which consists of two or more devices, it may be applied to the equipment which consists of one device. Moreover, it cannot be overemphasized that this invention can be applied also when attained by supplying a program to a system or equipment. In this case, that system or equipment becomes possible [ enjoying the effectiveness of this invention ] by reading the storage which stored the program expressed by the software for attaining this invention to this system or equipment.

[0057] Next, a storage like a hard disk 8 used with the information processor of this operation

gestalt is explained using drawing 12 , for example.

[0058] Drawing 12 is the memory map of the storage which memorized the printer status-display program (status monitor) in each operation gestalt of this invention.

[0059] What is necessary is to be used with the information processor which controls a printer through a bidirectional interface, and just to store the program code of a "recognition module" and a "control module" in a storage at least, as shown in the storage which stores the control program which controls the time interval which transmits the demand command of status data to a printer at drawing 12 according to the status of said printer.

[0060] Here, a "recognition module" is a program module for recognizing the status of a printer based on the status data acquired from the printer.

[0061] Moreover, a "control module" is a program module for controlling the time interval which transmits the demand command of status data to a printer according to the status of the printer recognized by the recognition module.

[0062] In addition, as a storage, a removable floppy disk, an optical disk, a magneto-optic disk, CD-ROM, a non-volatile memory card, etc. can be used for the information processor of body of host computer 3 grade other than the hard disk 8 of this operation gestalt.

[0063]

[Effect of the Invention] As explained above, the status of a printer is recognized based on the status data which were acquired from the printer according to this invention, and while being able to \*\* time difference with the status information of the printer displayed with information processors, such as a change of state of a printer, and a host computer, by controlling the time interval which transmits the demand command of status data to a printer according to the status of the recognized printer concerned, aggravation of the performance of a printer and an information processor is avoidable.

[0064] For example, when status data show under printer actuation, according to the status which changes frequently by shortening the transmitting time interval concerned, a status display can be updated with a short time interval.

[0065] Moreover, when status data show under printer standby, according to the status with comparatively little change, the updating frequency of a status display can be made small by lengthening the transmitting time interval concerned.

[0066] Moreover, when status data show a printer error, according to the status which changes frequently, with a short time interval, a status display can be updated and a user can cope with the error of a printer promptly by shortening the transmitting time interval concerned.

[0067] Moreover, when status data show under a printer error and printer actuation, according to the status which changes frequently, with the shortest time interval, a status display can be updated and a user can cope with the error of a printer promptly by shortening the transmitting time interval concerned most.

[0068] Moreover, when status data show under printer normal and printer standby, according to the status with comparatively little change, the updating frequency of a status display can be made the smallest by lengthening the transmitting time interval concerned most.

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## TECHNICAL FIELD

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[Field of the Invention] This invention relates to the storage which memorized the control program used with the information processor which controls a printer through a bidirectional interface, the printer control approach, and the information processor concerned.

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## PRIOR ART

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[Description of the Prior Art] In case image data is printed using the printer connected to the former, for example, a host computer, a host computer displays the received information on the display of a host computer etc. while receiving error information, such as a situation of a printer of operation, and print sheet plugging or an ink toner piece, etc. from a printer. This notifies a user of the condition of a printer.

[0003] Moreover, when the printer omits printing actuation, a host computer displays the received information on the display of a host computer etc. while receiving information, such as a situation of the online/off-line of a printer, and a closing motion situation of covering of a printer, from a printer.

[0004] As mentioned above, in order to acquire the status information of a printer, a host computer changes the status information which transmits the command it is directed that transmits status information to a printer to a printer, and is transmitted from the printer which received the command into the form of an alphabetic character, a graphic form, etc. which can be displayed, and shows it on the display of a host computer etc. In this case, directions of the status information transmission to a printer are usually performed for every fixed time interval set up beforehand from a host computer.

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## EFFECT OF THE INVENTION

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[Effect of the Invention] As explained above, the status of a printer is recognized based on the status data which were acquired from the printer according to this invention, and while being able to \*\* time difference with the status information of the printer displayed with information processors, such as a change of state of a printer, and a host computer, by controlling the time interval which transmits the demand command of status data to a printer according to the status of the recognized printer concerned, aggravation of the performance of a printer and an information processor is avoidable.

[0064] For example, when status data show under printer actuation, according to the status which changes frequently by shortening the transmitting time interval concerned, a status display can be updated with a short time interval.

[0065] Moreover, when status data show under printer standby, according to the status with comparatively little change, the updating frequency of a status display can be made small by lengthening the transmitting time interval concerned.

[0066] Moreover, when status data show a printer error, according to the status which changes frequently, with a short time interval, a status display can be updated and a user can cope with

the error of a printer promptly by shortening the transmitting time interval concerned.

[0067] Moreover, when status data show under a printer error and printer actuation, according to the status which changes frequently, with the shortest time interval, a status display can be updated and a user can cope with the error of a printer promptly by shortening the transmitting time interval concerned most.

[0068] Moreover, when status data show under printer normal and printer standby, according to the status with comparatively little change, the updating frequency of a status display can be made the smallest by lengthening the transmitting time interval concerned most.

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## TECHNICAL PROBLEM

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[Problem(s) to be Solved by the Invention] However, there were the following problems in information processors, such as the conventional host computer mentioned above. namely, a printer -- printing -- a host computer also in the situation that it is working and the condition of the printer concerned changes for a short time, in order not to require the status information of a printer for every fixed time interval set up beforehand When the time interval set up beforehand was too long as compared with spacing of the change of state of a printer, the problem that time difference occurred was between the situations of the printer displayed on the display of the actual situation of a printer, and a host computer etc.

[0006] Moreover, even when the time interval as which a host computer requires status information from a printer is set up short beforehand that the time difference mentioned above should be avoided, the printer omits printing actuation and there are comparatively few changes of state of a printer, a host computer must process the status information of a printer with a short time interval. For this reason, the host computer and the printer had the problem that effectiveness was bad.

[0007] This invention is made in view of the point mentioned above. The purpose can choose a suitable time interval to transmit the command which requires status information to a printer from two or more time intervals beforehand set up according to the status information of a printer while being able to recognize the status information of a printer. Furthermore, while time difference with the status information of the printer displayed with the change of state and host computer of a printer is mitigable It is offering the storage which memorized the control program for performing the information processor and the printer control approach aggravation of the performance of a host computer and a printer being avoidable, and the actuation concerned.

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## MEANS

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[Means for Solving the Problem] In order to attain the above-mentioned purpose, the information processor of the invention in this application is an information processor which controls a printer through a bidirectional interface, and has a recognition means recognize the status of said printer based on the status data acquired from said printer, and the control means which controls the time interval which transmits the demand command of said status data to said printer according to the status of said printer recognized with said recognition means.

[0009] In order to attain the above-mentioned purpose, the printer control approach of the



invention in this application is the printer control approach in the information processor which controls a printer through a bidirectional interface, and has the recognition process which recognizes the status of said printer based on the status data acquired from said printer, and the control process which control the time interval which transmits the demand command of said status data to said printer according to the status of said printer recognized at said recognition process.

[0010] In order to attain the above-mentioned purpose, the storage of the invention in this application It is the storage which memorized the control program used with the information processor which controls a printer through a bidirectional interface. The recognition module of the recognition process which recognizes the status of said printer based on the status data acquired from said printer, According to the status of said printer recognized by said recognition module, the control module of the control process which controls the time interval which transmits the demand command of said status data to said printer is memorized.

[0011]

[Embodiment of the Invention] Hereafter, the gestalt of operation of the 1st of this invention and the gestalt of the 2nd operation are explained with reference to a drawing.

[0012] (1) Explain gestalt point \*\* of the 1st operation, and the structure of a system concerning the gestalt of the 1st operation based on drawing 1 . The profile configuration of this system is carried out from the host computer 1 and the printer 2. Said host computer 1 consists of a body 3 of a host computer, a keyboard 4, and CRT5, and the body 3 of a host computer is further equipped with CPU6, RAM7, a hard disk 8, the hard disk (HDD) controller 9, the data input/output controller 10, ROM11, the keyboard controller 12, and CRT controller 13. Moreover, said printer 2 is equipped with the data input/output controller 14, CPU15, a program ROM 16 and a frame memory 17, the work-piece memory 18, and the printer engine 19 as shown in drawing 8 .

[0013] Drawing 8 is the external view showing the configuration of printer engine 19, for example, shows the case of an ink jet printer engine.

[0014] In drawing, the carriage HC engaged to the spiral slot 5004 of a leading screw 5005 which is interlocked with the forward inverse rotation of a drive motor 5013, and is rotated through the driving force transfer gears 5011 and 5009 has a pin (not shown), and both-way migration is carried out in an arrow head a and the direction of b through a guide rail 5003. The ink jet cartridge IJC equipped with the ink tank IT and the ink jet head IJH is carried in this carriage HC. 5002 is a paper bail plate and presses paper to a platen 5000 covering the carriage migration direction.

[0015] 5007 and 5008 are photo couplers, check existence [ in this region of the lever 5006 of carriage ], and function as a home-position detection means for performing a hand-of-cut switch of a drive motor 5013 etc. The member which directs the cap member 5022 to which 5016 caps the whole surface of a recording head, and 5015 are suction means to attract the inside of this cap, and perform suction recovery of a recording head through the opening 5023 in a cap. 5017 is a cleaning blade and becomes movable by the member 5019 at a cross direction. 5018 is a body support plate and supports the above-mentioned cleaning blade 5017 and a member 5019. It is a lever for starting suction of suction recovery, and it moves with migration of the cam 5020 which engages with carriage, and, as for 5012, migration control of the driving force from a drive motor 5013 is carried out with a means of communication with a well-known clutch switch etc.

[0016] When carriage comes to a home-position side field, it is constituted so that a request can



be processed according to an operation of a leading screw 5005 in those correspondence locations, but these capping, cleaning, and suction recovery should just be constituted so that request actuation may be performed to well-known timing.

[0017] If the configuration of each part shown in drawing 1 is explained in full detail, the host computer 1 formed as an information processor in a system. It is based on the operating system in a hard disk 8. With an application program etc. The function which outputs image data for the data with which the generated alphabetic character / graphic form / image are intermingled to a printer 2 through the printer control program in a hard disk 8 (printer driver), It has the function which displays the status information of a printer 2 on CRT5 through CRT controller 13 through a printer status-display program (status monitor) based on the operating system in a hard disk 8 (OS).

[0018] In addition, there is a printer driver for sending a Page Description Language to the printer driver and printer 2 for sending an image data to a printer 2 among the printer drivers.

[0019] The keyboard 3 is equipped with various keys and is for inputting data. CRT5 displays various information as shown in drawing 9 or drawing 10. In addition, a display means may not be limited to CRT, for example, other display means, such as liquid crystal, are sufficient as it. CPU6 controls the body 3 of a host computer based on various programs. RAM7 is write-in read-out memory at any time, and all the programs that operate in the host computer 1 interior are loaded, or it is used as work-piece memory working [ a program ]. The data which need a hard disk 8 in case the various programs other than various programs, such as an application program, a printer control program (printer driver), and a printer status-display program (status monitor), operate are stored. The hard disk controller 9 performs read-out / write-in processing of data or a program stored in the hard disk 8.

[0020] The data input/output controller 10 A bidirectional data communication interface By (for example, the BAISENTORO interface of IEEE 1284 specification) connecting with the printer 2, and performing transmission and reception of the command and data which are later mentioned between printers 2. The command for printer control and data which were generated with the above-mentioned printer control program are transmitted to a printer 2 side, or data, such as the status conversely sent from the printer 2 side, are received, and it holds temporarily to a non-illustrated internal memory. ROM11 is a read-only memory and consists of fonts ROM which store the font data used in case various programs are performed on a host computer 1 or various information is displayed on [ other than the data ROM which store the program ROM which stores the program for various basic actuation of controlling various controllers, and data ] CRT5. The keyboard controller 12 controls the key input from the keyboard 4 connected to the host computer 1. CRT controller 13 controls the display to CRT5 for a display.

[0021] A printer 2 transmits printer condition data (status) to a host computer 1 according to the received command while receiving the command which records the image data which received on a record form, and requires transmission of a printer condition from a host computer 1 while receiving the image data transmitted from the host computer 1. The data input/output controller 14 receives the image data transmitted from the host computer 1 to the printer 2, or transmits the status from a printer 2 side to a host computer 1. CPU15 controls the body of a printer. The program for a program ROM 16 to perform a series of printer actuation on which the image data which received from the host computer 1 is made to record with printer engine 19 is stored.

[0022] In addition, when printer language like a Page Description Language is received from a host computer 1, the emulation program which analyzes the printer language concerned and generates an image data is also stored.

[0023] A frame memory 17 is the memory holding the image data which received or it was generated by the emulation program within a program ROM 16. The work-piece memory 18 is memory used in various processings of image recording including generation processing of an image data. The image which printer engine 19 records in a color the image data held to the frame memory 17 on a record form, and can be recorded with the printer engine 19 concerned is a binary record pattern.

[0024] furthermore, when the printer 2 which has the above-mentioned configuration is supporting status information acquisition commands, such as operating state of the printer 2 concerned, and an error situation, and the command concerned is received While judging the any the error has generated whether it is under delivery whether the operating state of a printer 2 is printing, and they are not, either, when the error has occurred, the error code beforehand set up corresponding to the error concerned is transmitted. The data format of the error code transmitted at the time of error generating serves as printer status information as shown in drawing 4.

[0025] With the gestalt of the 1st operation, the data input/output controller 10 of a host computer 1 While constituting a command transmitting means to transmit a status information acquisition command to a printer 2 A status information receiving means to receive the status information showing operating state, an error situation, etc. of the printer 2 transmitted from the printer 2 is constituted. CPU6 of a host computer 1 The control means which controls the time interval which publishes a status information acquisition command to a printer 2 according to the condition of a printer 2 consists of said status information.

[0026] Next, actuation of the printer status-display program (status monitor) shown in the flow chart of drawing 2 is explained.

[0027] First, CPU6 determines the initial value of the time interval to which a host computer 1 transmits a status information acquisition command to a printer 2 as 1.0 seconds, and stores the initial value concerned in the status acquisition spacing record section prepared in RAM7 of a host computer 1 (step S101). Next, CPU6 sets up a status display field on CRT5 of a host computer 1 (step S102). As shown in drawing 9 or drawing 10, the situation of operation and error situation of a printer 2 are displayed on the status display field concerned using a character string or a bitmapped image.

[0028] Next, CPU6 judges whether the user is demanding termination of a printer status-display program (step S103), and when it is judged that termination of a program is demanded, it ends a program. On the other hand, when it is judged that termination of a program is not demanded It judges whether the time amount (for example, 1 second) stored in the status acquisition spacing record section in RAM7 after CPU6 transmits a status acquisition command to a printer 2 last time passed (step S104). When it is judged that it passed, status display processing is performed (step S105), and processing not more than step S103 is repeated. On the other hand, after transmitting a status acquisition command to a printer 2 last time, when it is judged that the time amount (2 seconds) stored in the status acquisition spacing record section in RAM7 has not passed, processing not more than step S103 is repeated.

[0029] In addition, a non-illustrated timer is started with initiation of the printer status-display program concerned. And when the status acquisition command is not transmitted last time, it judges whether the above-mentioned time amount (1 second) has passed since program initiation at step S104.

[0030] As mentioned above, it repeats and performs between step S103 and step S105 until CPU6 in the information processor concerning the gestalt of this operation has a program termination demand of a user, after ending processing of step S101 and step S103.

[0031] Next, actuation of the status display processing shown as step S105 is explained to above-mentioned drawing 2 based on the flow chart of drawing 3.

[0032] First, CPU6 of a host computer 1 transmits the status information acquisition command which a printer 2 supports to a printer 2 so that it may investigate the operating state and error situation of a printer 2 (step S201). Next, CPU6 of a host computer 1 receives and reads the status information transmitted from the printer 2 (step S202). As shown in drawing 4, the information on the operating state and error situation of a printer 2 is included in the status information concerned, and this value is used henceforth.

[0033] in addition -- the field of the operating state of drawing 4 -- under feeding -- under (LD) and printing -- under (PR) and delivery -- (EJ) -- waiting -- the error code which 2 bytes of character string showing four kinds of operating state of (NO) is stored, and is expressed with 4 bytes of printer 2 proper showing the category of error generated by the printer 2 to the field of an error situation -- or 4 bytes of code showing the error having not occurred is stored. For example, in jam generating of 1000, 1300 is stored when you have no form.

[0034] If CPU6 of a host computer 1 receives status data at the above-mentioned step S202 and stores them in the work-piece memory of RAM7, it will judge whether the status data received from the printer 2 at the above-mentioned step S202 are changing from the status data in which the condition of the printer 2 currently displayed on CRT5 of the current host computer 1 is shown (step S203). The judgment concerned is performed in order not to process modification of future status displays etc., when there is no change in the status. When it is judged that it is the same as the status data in which the condition of the printer 2 which the status data received from the printer 2 show on CRT5 of the present host computer 1 is shown, status display processing is interrupted and it shifts to step S103 of above-mentioned drawing 1.

[0035] In addition, it judges whether the status data in which the condition of the printer 2 currently displayed on CRT5 is shown are stored in the work-piece memory of RAM7, compared this status data with the received status data at step S203, and changed.

[0036] the case where the status data in which the contents which show the host computer 1 to the status data and CRT5 of the received printer 2 are shown judge that it differs -- a printer 2 -- printing -- the contents of the operating-state field of the status data received from the printer 2 judge whether a printer 2 means operating in either feeding / printing / delivery in order whether it is working or waiting (step S204).

[0037] When the contents of the operating state field express either of the (EJ(s)) during (PR) and delivery during (LD) and printing during feeding, the contents of the status acquisition spacing record section in RAM7 of a host computer 1 are changed into the value (for example, 0.5 seconds) of the set point 1 of the status acquisition spacing data shown in drawing 5 (step S205), and it shifts to step S207. on the other hand, the contents of the operating state field are waiting -- when (NO) is expressed, the contents of the status acquisition spacing record section in RAM7 of a host computer 1 are changed into the value (for example, 2.0 seconds) of the set point 2 of the status acquisition spacing data shown in drawing 5 (step S206), and it shifts to step S207.

[0038] In addition, the field shown in drawing 5 is beforehand stored in the work-piece memory of RAM7.

[0039] Here, the value of the set point 1 of drawing 5 is set up smaller than the value of the set point 2, and when a printer 2 is working and the status of a printer 2 changes frequently, according to it, a host computer 1 acquires the status information of a printer 2 with a short time interval. Moreover, a printer 2 is waiting, and when the case where change of the status is more

nearly working is not frequent, it controls not to spoil the performance of a host computer 1 and a printer 2 by lengthening the time interval to which a host computer 1 acquires status information from a printer 2.

[0040] After processing of the above-mentioned step S205 or step S206 is completed, a host computer 1 displays the contents received from the printer 2 at the above-mentioned step S202 on CRT5 (step S207). Then, it returns to step S103 of above-mentioned drawing 1. For example, if the status which received is printing, the contents shown in drawing 9 will be expressed to CRT5 as step S207. Moreover, if the status which received is waiting, the contents shown in drawing 10 will be expressed to CRT5 as step S207.

[0041] As mentioned above, according to the gestalt of the 1st operation, transmit a status information acquisition command to the printer 2 by which the host computer 1 was connected to the host computer 1 concerned, and status information is received from a printer 2. When displaying the contents on CRT5 as the operating state and error situation of a printer 2 The time interval at the time of a host computer 1 repeating a series of actuation of transmitting a status information acquisition command to a printer 2, and receiving the response (polling interval) It is based on whether actuation called feeding, printing, and delivery is performed or to be waiting by the printer 2. If the printer 2 is waiting, in order to set it as the short time interval set up beforehand if the printer 2 is working, and to set it as the long time interval set up beforehand, When a printer 2 is working and the status changes frequently It becomes possible to update a status display with a short time interval according to it, and a printer 2 is waiting. When there is comparatively little change of the status It becomes possible to control to become possible to make small the frequency which updates a status display, consequently not to spoil the performance of a host computer 1 and a printer 2.

[0042] (2) With the gestalt of implementation of the gestalt above 1st of the 2nd operation, a host computer 1 transmits a status information acquisition command to a printer 2. Although the printer 2 is performing feeding, printing, and control changed on the basis of whether actuation called delivery in the time interval which repeats a series of actuation of receiving the status information which is the response of the printer 2 to this from a printer 2 is performed The gestalt of operation of \*\*\*\* 2 in addition, when an error occurs by the printer 2 A host computer 1 transmits a status information acquisition command to a printer 2, and the time interval which repeats a series of actuation of receiving the status information which is the response is set up shorter than the case where the error has not occurred. A user enables it to cope with the error of a printer 2 promptly by updating the status display on CRT5 with a short time interval.

[0043] The system configuration concerning the gestalt of the 2nd operation is the same as the system configuration concerning the gestalt of implementation of the above 1st, and the point in which the gestalt of the 2nd operation carries out difference to the gestalt of implementation of the above 1st is a point performed as the flow chart of drawing 6 shows the status display processing shown in the flow chart of above-mentioned drawing 2 as step S105.

[0044] In drawing 6, CPU6 of a host computer 1 transmits the status information acquisition command which a printer 2 supports to a printer 2 so that it may investigate the operating state and error situation of a printer 2 (step S301). Next, CPU6 of a host computer 1 receives and reads the status information transmitted from the printer 2 (step S302). As shown in above-mentioned drawing 4, the information on the operating state and error situation of a printer 2 is included in the status information concerned, and this value is used henceforth.

[0045] It judges whether CPU6 of a host computer 1 is changing from the stage data in which the condition of a printer 2 that the status data which are RAM7, and which were received from the

printer 2 at the above-mentioned step S302 when work-piece memory storing was carried out show status data on CRT5 of the current host computer 1 at the above-mentioned step S302 is shown (step S303). The judgment concerned is performed in order not to process modification of future status displays etc., when there is no change in the status.

[0046] In addition, it judges whether the status data in which the condition of the printer 2 currently displayed on CRT5 is shown are stored in the work-piece memory of RAM7, compared this status data with the received status data at step S303, and changed.

[0047] The contents of the error situation field of the status data received from the printer 2 so that CPU6 of a host computer 1 may get to know whether a printer 2 is an error situation judge ~~the numeric value showing the error having occurred, or the numeric value showing the error having not occurred (step S304).~~ When it is judged that the contents of the error situation field of status data express the error of a printer 2 First, the current time of a non-illustrated timer is set as the error generating time-of-day storage region established in RAM7 of a host computer 1 (step S305). For example, while setting to the field of the set point 1 of the status acquisition spacing data which chose the first train of a status acquisition spacing table as shown in drawing 7, and showed the contents of the first line to above-mentioned drawing 5 The contents of the second line are set to the field of the set point 2 of status acquisition spacing data (step S306), and it shifts to step S309.

[0048] On the other hand, when it is judged that the contents of the error situation field of status data do not express the error of a printer 2, CPU6 of a host computer 1 First, the storage value and current time of the error generating time-of-day storage region prepared at step S305 are compared. It judges whether the convention time amount (for example, 10 seconds) memorized in the convention time amount storage region established in RAM7 of a host computer 1 from the time of day set as the error generating time-of-day storage region has passed (step S307). When it is judged that convention time amount has already passed, the second train of the status acquisition spacing table shown in above-mentioned drawing 7 is chosen, and while setting to the field of the set point 1 of the status acquisition spacing data which showed the contents of the first line to above-mentioned drawing 5, the contents of the second line are set to the field of the set point 2 of status acquisition spacing data (step S306), and it shifts to step S309. When it is judged that convention time amount has not passed yet, it shifts to the direct step S309.

[0049] In addition, when the error has not occurred once, CPU6 judges whether convention time amount has passed since the start time of a printer status-display program at step S307.

[0050] Here, the status acquisition spacing table of above-mentioned drawing 7 is a field which remembers status acquisition spacing in each case of being waiting that a printer 2 is working about each when the case where are in the status acquisition spacing table storage region established in RAM7 of a host computer 1, and the error has occurred by the printer 2, and the error have not occurred. As status acquisition spacing memorized by the status acquisition spacing table was shown in drawing 7, if T1 (for example, 0.5 seconds), T2 (for example, 1.0 seconds), T3 (for example, 1.0 seconds), and T four (for example, 2.0 seconds), T1 shall be smaller than T2, T3 shall be smaller than T four, T1 shall be smaller than T3, and T2 shall be beforehand set up so that it may become small rather than T four.

[0051] After processing of the above-mentioned step S306, step S308, or step S307 is completed, a host computer 1 judges whether with reference to the operating state field of the status data of the printer 2 concerned received from the printer 2, the printer 2 is operating in feeding, printing, or delivery at the above-mentioned step S302, or it is standing by (step S309).

[0052] When it is judged that a printer 2 is working, the contents of the status acquisition spacing

record section in RAM7 of a host computer 1 are changed into the value of the set point 1 of status acquisition spacing data (step S310), and it shifts to step S312. On the other hand, when it is judged that a printer 2 is waiting, the contents of the status acquisition spacing record section in RAM7 of a host computer 1 are changed into the value of the set point 2 of status acquisition spacing data (step S311), and it shifts to step S312.

[0053] That is, when the time interval which performs processing for updating a status display rather than the case where the error has not occurred when the error has occurred by the printer 2 becomes short and the printer 2 is performing feeding, printing, and actuation of delivery, the time interval which performs processing for updating a status display rather than the case where it is not operating will become short.

[0054] After processing of the above-mentioned step S310 or step S311 is completed, a host computer 1 displays the contents received from the printer 2 at the above-mentioned step S302 on CRT5 of a host computer 1 (step S312), and returns to step S103 of above-mentioned drawing 1 after that. For example, if the status which received is jam occurring, the contents shown in drawing 11 will be displayed on CRT5 by S312.

[0055] As mentioned above, when it is judged according to the gestalt of the 2nd operation that the error has generated a host computer 1 to the printer 2 while it judges whether the error has occurred to the printer 2. In order to set up shorter than the case where the error has not occurred the time interval at the time of repeating a series of actuation of transmitting a status information acquisition command to a printer 2, and receiving the response (polling interval), At the time of error generating of a printer 2, time amount which updates a status display can be shortened and a user can cope with the error of a printer 2 now promptly. For example, in jam generating, according to the contents of a display of drawing 11, a user can cope with it promptly at an error. Moreover, also when an error recurs immediately after an error situation is canceled temporarily, without a user performing right management to an error, in order to continue shortening the time interval which acquires status information until fixed time amount passes since the time of error generating even when the error of a printer 2 is canceled, it can urge performing a status display promptly and coping with a user at an error.

[0056] In addition, even if it applies this invention to the system which consists of two or more devices, it may be applied to the equipment which consists of one device. Moreover, it cannot be overemphasized that this invention can be applied also when attained by supplying a program to a system or equipment. In this case, that system or equipment becomes possible [ enjoying the effectiveness of this invention ] by reading the storage which stored the program expressed by the software for attaining this invention to this system or equipment.

[0057] Next, a storage like a hard disk 8 used with the information processor of this operation gestalt is explained using drawing 12, for example.

[0058] Drawing 12 is the memory map of the storage which memorized the printer status-display program (status monitor) in each operation gestalt of this invention.

[0059] What is necessary is to be used with the information processor which controls a printer through a bidirectional interface, and just to store the program code of a "recognition module" and a "control module" in a storage at least, as shown in the storage which stores the control program which controls the time interval which transmits the demand command of status data to a printer at drawing 12 according to the status of said printer.

[0060] Here, a "recognition module" is a program module for recognizing the status of a printer based on the status data acquired from the printer.

[0061] Moreover, a "control module" is a program module for controlling the time interval

which transmits the demand command of status data to a printer according to the status of the printer recognized by the recognition module.

[0062] In addition, as a storage, a removable floppy disk, an optical disk, a magneto-optic disk, CD-ROM, a non-volatile memory card, etc. can be used for the information processor of body of host computer 3 grade other than the hard disk 8 of this operation gestalt.

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## DESCRIPTION OF DRAWINGS

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### [Brief Description of the Drawings]

[Drawing 1] It is the block diagram showing the structure of a system which consists of the host computer and printer concerning the gestalt of the 1st and operation of the 2nd of this invention.

[Drawing 2] It is the flow chart which shows the processing actuation concerning the gestalt of the 1st and the 2nd operation.

[Drawing 3] It is the flow chart which shows processing actuation of the status display processing concerning the gestalt of the 1st operation.

[Drawing 4] It is the explanatory view showing the data format of the printer status data concerning the gestalt of the 1st and the 2nd operation.

[Drawing 5] It is the explanatory view showing the data format of the status acquisition spacing data concerning the gestalt of the 1st and the 2nd operation.

[Drawing 6] It is the flow chart which shows processing actuation of the status display processing concerning the gestalt of the 2nd operation.

[Drawing 7] It is the explanatory view showing the data format of the status acquisition spacing table concerning the gestalt of the 2nd operation.

[Drawing 8] It is the external view of the printer engine of the printer concerning the gestalt of the 1st and operation of the 2nd of this invention.

[Drawing 9] It is drawing showing the contents of a status display under printer printing concerning the gestalt of the 1st and operation of the 2nd of this invention.

[Drawing 10] It is drawing showing the contents of a status display under printer standby concerning the gestalt of the 1st and operation of the 2nd of this invention.

[Drawing 11] It is drawing showing the contents of a status display under printer jam generating concerning the gestalt of operation of the 2nd of this invention.

[Drawing 12] It is the memory map of the storage which memorized the printer status-display program concerning the gestalt of the 1st and operation of the 2nd of this invention.

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## CORRECTION OR AMENDMENT

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[Procedure revision]

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[Procedure amendment 1]

[Document to be Amended] Specification

[Item(s) to be Amended] Claim

[Method of Amendment] Modification

[Proposed Amendment]

[Claim(s)]

[Claim 1] They are data or the information processor which can transmit and receive a command between printers through a bidirectional interface,

A recognition means to recognize the status of said printer based on the status data acquired from said printer,

The information processor characterized by having the control means which controls the time interval which transmits the demand command which requires said status data to said printer according to the status recognized with said recognition means.

[Claim 2] Said control means is an information processor according to claim 1 characterized by shortening said time interval when said status data show under actuation.

[Claim 3] Said control means is claim 1 characterized by lengthening said time interval when said status data show under standby, or an information processor given in 2.

[Claim 4] Said control means is an information processor according to claim 1 to 3 characterized by shortening said time interval when said status data show an error.

[Claim 5] It is the printer control approach which controls a printer through a bidirectional interface,

The recognition step which recognizes the status of said printer based on the status data acquired from said printer,

The printer control approach characterized by having the control step which controls the time interval which transmits the demand command which requires said status data to said printer according to the status recognized at said recognition step.

[Claim 6] The printer control approach according to claim 5 characterized by shortening said time interval at said control step when said status data show under actuation.

[Claim 7] Claim 5 characterized by lengthening said time interval at said control step when said status data show under TA standby, or the printer control approach given in 6.

[Claim 8] The printer control approach according to claim 5 to 7 characterized by shortening said time interval at said control step when said status data show an error.

[Claim 9] The printer control approach according to claim 5 to 8 characterized by shortening said



time interval most at said control step when said status data show under an error and actuation.

[Claim 10] The printer control approach according to claim 5 to 9 characterized by lengthening said time interval most at said control step when said status data show under normal and standby.

[Claim 11] The transmitting step which transmits a demand command in the first half according to the time interval controlled by said control step,

The printer control approach according to claim 5 to 10 characterized by having the receiving step which receives said status data.

[Claim 12] The printer control approach according to claim 5 to 11 characterized by having the display step which displays the status of said printer based on said status data.

[Claim 13] When said status data show an error, it has the setting step which sets current time as an error generating time-of-day storage region,

Said control step is the printer control approach according to claim 1 to 12 characterized by controlling said time interval according to the status recognized at said recognition step when convention time amount has passed since said current time when said status data do not show the error at and were set as said error generating time-of-day storage region.

[Procedure amendment 2]

[Document to be Amended] Specification

[Item(s) to be Amended] 0008

[Method of Amendment] Modification

[Proposed Amendment]

[0008]

[Means for Solving the Problem] The information processor which applies to this invention in order to solve the above-mentioned technical problem is data or the information processor which transmits and receives a command between printers, and is characterized through a bidirectional interface by to have the control means which controls the time interval which transmits the demand command which requires said status data to said printer according to the status which has recognized with a recognition means recognize the status of said printer based on the status data acquired from said printer, and said recognition means.

[Procedure amendment 3]

[Document to be Amended] Specification

[Item(s) to be Amended] 0009

[Method of Amendment] Modification

[Proposed Amendment]

[0009] Moreover, the printer control approach concerning this invention is the printer control approach which controls a printer through a bidirectional interface, and is characterized by to have the control step which controls the time interval which transmits the demand command which requires said status data to said printer according to the status which has recognized at the recognition step which recognizes the status of said printer based on the status data acquired from said printer, and said recognition step.

[Procedure amendment 4]

[Document to be Amended] Specification

[Item(s) to be Amended] 0010

[Method of Amendment] Modification

[Proposed Amendment]

[0010] Furthermore, at the control step in the printer control approach concerning this invention,

when said status data show under actuation, said time interval is shortened, or when said status data show under TA standby, said time interval is lengthened, or when said status data show an error, said time interval is shortened, or when said status data of said show under an error and actuation, it is characterized by to shorten said time interval most.

[Procedure amendment 5]

[Document to be Amended] Specification

[Item(s) to be Amended] 0064

[Method of Amendment] Modification

[Proposed Amendment]

- [0064]—Time difference as explained above, after the condition of a printer changes by controlling the time interval which transmits the demand command which requires status data to a printer according to the status which has recognized and recognized the status of a printer based on the status data acquired from the printer according to this invention until the status information of a printer is displayed on an information processor can be lessened.

Status-controlled interrogation of peripheral device status  
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Applicant(s): CANON KK (JP)  
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Equivalents:

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Abstract  
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In a host computer which controls a peripheral device such as a printer, information is recognized which indicates a status of the peripheral device and a suitable time interval is selected to transmit on an interrogation command to demand the status of the peripheral device to the peripheral device. The time interval is selected based on the status of the peripheral device, and may be selected from among several time intervals set up in advance, for example, in a table.

[0055] As described above, according to the second implementation mode, the host computer 1 judges whether an error occurs in the printer 2 or not, and in case that it judged that the error occurs in the printer 2, a time interval (polling time interval) on the occasion of repeating a series of such operations that it transmits a status information obtaining command to the printer 2, and receives its response is set up to be shorter than in such a case that an error does not occur, and therefore, time for updating status display at the time of error occurrence of the printer 2 is shortened, and a user can quickly deal with an error of the printer 2. For example, in case of jam occurrence, in accordance with a display content of Fig. 11, a user can deal with the error quickly. Also, even in case that the error of the printer 2 was eliminated, a time interval for obtaining status information is continuously shortened until a give length of time passes over from the error occurrence time, and therefore, even in case that a user does not deal with the error correctly, and after an error status was eliminated temporarily, and the error occurs again short time later, it is possible to urge a user to deal with the error by carrying out status display quickly.

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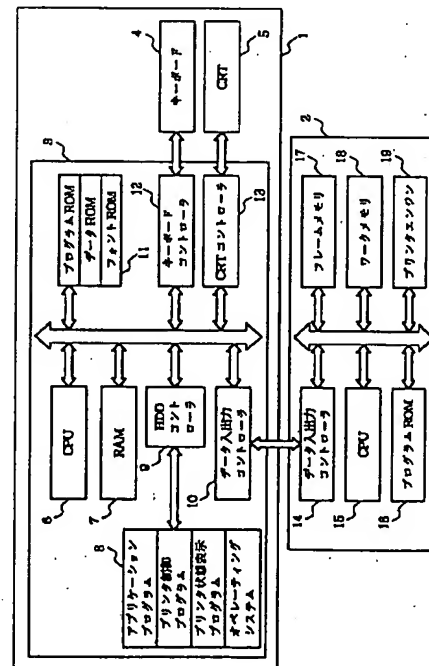
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(54) 【発明の名称】 情報処理装置、プリンタ制御方法及び記憶媒体

(57) 【要約】

【課題】 プリンタの状態情報を認識できると共に、プリンタの状態情報に応じて予め設定された複数の時間間隔からプリンタに状態情報を要求するコマンドを送信するのに適当な時間間隔を選択でき、更に、プリンタの状態変化とホストコンピュータで表示されるプリンタの状態情報との時間差を軽減できると共に、ホストコンピュータ及びプリンタのパフォーマンスの悪化を回避することができる情報処理装置及びプリンタ制御方法を提供する。

【解決手段】 双方向インタフェースを介してプリンタを制御する情報処理装置であって、前記プリンタから取得したステータスデータに基づいて前記プリンタのステータスを認識する認識手段と、前記認識手段で認識した前記プリンタのステータスに応じて、前記ステータスデータの要求コマンドを前記プリンタへ送信する時間間隔を制御する制御手段とを有する。



【特許請求の範囲】

【請求項1】 双方向インタフェースを介してプリンタを制御する情報処理装置であって、

前記プリンタから取得したステータスデータに基づいて前記プリンタのステータスを認識する認識手段と、前記認識手段で認識した前記プリンタのステータスに応じて、前記ステータスデータの要求コマンドを前記プリンタへ送信する時間間隔を制御する制御手段とを有することを特徴とする情報処理装置。

【請求項2】 前記ステータスデータがプリンタ動作中を示す場合には、前記制御手段は前記送信時間間隔を短くすることを特徴とする請求項1記載の情報処理装置。

【請求項3】 前記ステータスデータがプリンタ待機中を示す場合には、前記制御手段は前記送信時間間隔を長くすることを特徴とする請求項1記載の情報処理装置。

【請求項4】 前記ステータスデータがプリンタエラーを示す場合には、前記制御手段は前記送信時間間隔を短くすることを特徴とする請求項1記載の情報処理装置。

【請求項5】 前記ステータスデータがプリンタエラー及びプリンタ動作中を示す場合には、前記制御手段は前記送信時間間隔を最も短くすることを特徴とする請求項1記載の情報処理装置。

【請求項6】 前記ステータスデータがプリンタ正常及びプリンタ待機中を示す場合には、前記制御手段は前記送信時間間隔を最も長くすることを特徴とする請求項1記載の情報処理装置。

【請求項7】 前記情報処理装置は、前記ステータスデータを前記プリンタから受信するための受信手段を有することを特徴とする請求項1記載の情報処理装置。

【請求項8】 前記情報処理装置は、前記ステータスデータの要求コマンドを前記プリンタへ送信するための送信手段を有することを特徴とする請求項1記載の情報処理装置。

【請求項9】 前記情報処理装置は、ホストコンピュータであることを特徴とする請求項1記載の情報処理装置。

【請求項10】 双方向インタフェースを介してプリンタを制御する情報処理装置におけるプリンタ制御方法であって、

前記プリンタから取得したステータスデータに基づいて前記プリンタのステータスを認識する認識工程と、前記認識工程で認識した前記プリンタのステータスに応じて、前記ステータスデータの要求コマンドを前記プリンタへ送信する時間間隔を制御する制御工程とを有することを特徴とするプリンタ制御方法。

【請求項11】 前記ステータスデータがプリンタ動作中を示す場合には、前記制御工程は前記送信時間間隔を短くすることを特徴とする請求項10記載のプリンタ制御方法。

【請求項12】 前記ステータスデータがプリンタ待機

中を示す場合には、前記制御工程は前記送信時間間隔を長くすることを特徴とする請求項10記載のプリンタ制御方法。

【請求項13】 前記ステータスデータがプリンタエラーを示す場合には、前記制御工程は前記送信時間間隔を短くすることを特徴とする請求項10記載のプリンタ制御方法。

【請求項14】 前記ステータスデータがプリンタエラー及びプリンタ動作中を示す場合には、前記制御工程は前記送信時間間隔を最も短くすることを特徴とする請求項10記載のプリンタ制御方法。

【請求項15】 前記ステータスデータがプリンタ正常及びプリンタ待機中を示す場合には、前記制御工程は前記送信時間間隔を最も長くすることを特徴とする請求項10記載のプリンタ制御方法。

【請求項16】 前記情報処理装置は、受信手段で前記ステータスデータを前記プリンタから受信することを特徴とする請求項10記載のプリンタ制御方法。

【請求項17】 前記情報処理装置は、送信手段で前記ステータスデータの要求コマンドを前記プリンタへ送信することを特徴とする請求項10記載のプリンタ制御方法。

【請求項18】 前記情報処理装置は、ホストコンピュータであることを特徴とする請求項10記載のプリンタ制御方法。

【請求項19】 双方向インタフェースを介してプリンタを制御する情報処理装置で使用される制御プログラムを記憶した記憶媒体であって、前記プリンタから取得したステータスデータに基づいて前記プリンタのステータスを認識する認識工程の認識モジュールと、

前記認識モジュールで認識した前記プリンタのステータスに応じて、前記ステータスデータの要求コマンドを前記プリンタへ送信する時間間隔を制御する制御工程の制御モジュールとを記憶することを特徴とする記憶媒体。

【請求項20】 前記ステータスデータがプリンタ動作中を示す場合には、前記制御モジュールは前記送信時間間隔を短くすることを特徴とする請求項19記載の記憶媒体。

【請求項21】 前記ステータスデータがプリンタ待機中を示す場合には、前記制御モジュールは前記送信時間間隔を長くすることを特徴とする請求項19記載の記憶媒体。

【請求項22】 前記ステータスデータがプリンタエラーを示す場合には、前記制御モジュールは前記送信時間間隔を短くすることを特徴とする請求項19記載の記憶媒体。

【請求項23】 前記ステータスデータがプリンタエラー及びプリンタ動作中を示す場合には、前記制御モジュールは前記送信時間間隔を最も短くすることを特徴とする

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る請求項 19 記載の記憶媒体。

【請求項 24】 前記ステータスデータがプリンタ正常及びプリンタ待機中を示す場合には、前記制御モジュールは前記送信時間間隔を最も長くすることを特徴とする請求項 19 記載の記憶媒体。

【請求項 25】 前記情報処理装置は、受信手段で前記ステータスデータを前記プリンタから受信することを特徴とする請求項 19 記載の記憶媒体。

【請求項 26】 前記情報処理装置は、送信手段で前記ステータスデータの要求コマンドを前記プリンタへ送信することを特徴とする請求項 19 記載の記憶媒体。

【請求項 27】 前記情報処理装置は、ホストコンピュータであることを特徴とする請求項 19 記載の記憶媒体。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】 本発明は、双方向インタフェースを介してプリンタを制御する情報処理装置、プリンタ制御方法及び当該情報処理装置で使用される制御プログラムを記憶した記憶媒体に関する。

【0002】

【従来の技術】 従来、例えばホストコンピュータに接続されたプリンタを使用して画像データを印刷する際には、ホストコンピュータは、プリンタの動作状況や印刷用紙詰まり或いはインク・トナー切れ等のエラー情報等をプリンタから受信すると共に、受信した情報等をホストコンピュータのディスプレイ等に表示するようになっている。これにより、利用者へプリンタの状態を通知するようになっている。

【0003】 また、プリンタが印刷動作を行っていない場合においても、ホストコンピュータは、プリンタのオンライン/オフラインの状況やプリンタのカバーの開閉状況等の情報をプリンタから受信すると共に、受信した情報等をホストコンピュータのディスプレイ等に表示するようになっている。

【0004】 上記のように、ホストコンピュータは、プリンタの状態情報を取得するために、プリンタに対して状態情報を送信するように指示するコマンドをプリンタへ送信し、コマンドを受信したプリンタから送信されてくる状態情報を文字や図形等の表示可能な形に変換して、ホストコンピュータのディスプレイ等に表示している。この場合、ホストコンピュータからプリンタに対する状態情報送信の指示は、通常、予め設定した一定時間間隔毎に行われる。

【0005】

【発明が解決しようとする課題】 しかしながら、上述した従来のホストコンピュータ等の情報処理装置においては、下記のような問題があった。即ち、プリンタが印刷動作中で短時間に当該プリンタの状態が変化するような状況においても、ホストコンピュータは予め設定された

一定時間間隔毎にしかプリンタの状態情報を要求しないため、予め設定してある時間間隔がプリンタの状態変化の間隔と比較して長すぎる場合には、プリンタの実際の状況とホストコンピュータのディスプレイ等に表示されるプリンタの状況との間に時間差が発生するという問題があった。

【0006】 また、前述した時間差を回避すべく、ホストコンピュータがプリンタに対して状態情報を要求する時間間隔を予め短く設定した場合には、プリンタが印刷動作を行っていない時など、プリンタの状態変化が比較的少ない時でも、ホストコンピュータは短い時間間隔でプリンタの状態情報を処理しなければならない。このため、ホストコンピュータ、プリンタともに効率が悪いという問題があった。

【0007】 本発明は、上述した点に鑑みなされたものであり、プリンタの状態情報を認識できると共に、プリンタの状態情報に応じて予め設定された複数の時間間隔からプリンタに状態情報を要求するコマンドを送信するのに適当な時間間隔を選択でき、更に、プリンタの状態変化とホストコンピュータで表示されるプリンタの状態情報との時間差を軽減できると共に、ホストコンピュータ及びプリンタのパフォーマンスの悪化を回避することができる情報処理装置、プリンタ制御方法及び当該動作を実行するための制御プログラムを記憶した記憶媒体を提供することを目的とする。

【0008】

【課題を解決するための手段】 上記目的を達成するために、本願発明の情報処理装置は、双方向インタフェースを介してプリンタを制御する情報処理装置であって、前記プリンタから取得したステータスデータに基づいて前記プリンタのステータスを認識する認識手段と、前記認識手段で認識した前記プリンタのステータスに応じて、前記ステータスデータの要求コマンドを前記プリンタへ送信する時間間隔を制御する制御手段とを有する。

【0009】 上記目的を達成するために、本願発明のプリンタ制御方法は、双方向インタフェースを介してプリンタを制御する情報処理装置におけるプリンタ制御方法であって、前記プリンタから取得したステータスデータに基づいて前記プリンタのステータスを認識する認識工程と、前記認識工程で認識した前記プリンタのステータスに応じて、前記ステータスデータの要求コマンドを前記プリンタへ送信する時間間隔を制御する制御工程とを有する。

【0010】 上記目的を達成するために、本願発明の記憶媒体は、双方向インタフェースを介してプリンタを制御する情報処理装置で使用される制御プログラムを記憶した記憶媒体であって、前記プリンタから取得したステータスデータに基づいて前記プリンタのステータスを認識する認識工程の認識モジュールと、前記認識モジュールで認識した前記プリンタのステータスに応じて、前記

ステータスデータの要求コマンドを前記プリンタへ送信する時間間隔を制御する制御工程の制御モジュールとを記憶する。

【0011】

【発明の実施の形態】以下、本発明の第1の実施の形態及び第2の実施の形態を図面を参照して説明する。

【0012】(1)第1の実施の形態

まず、第1の実施の形態に係るシステムの構成を図1に基づき説明する。本システムは、ホストコンピュータ1と、プリンタ2とから大略構成されている。前記ホストコンピュータ1は、ホストコンピュータ本体3と、キーボード4と、CRT5とから構成されており、更に、ホストコンピュータ本体3は、CPU6と、RAM7と、ハードディスク8と、ハードディスク(HDD)コントローラ9と、データ入出力コントローラ10と、ROM11と、キーボードコントローラ12と、CRTコントローラ13とを備えている。また、前記プリンタ2は、データ入出力コントローラ14と、CPU15と、プログラムROM16と、フレームメモリ17と、ワークメモリ18と、図8に示す様なプリンタエンジン19とを備えている。

【0013】図8はプリンタエンジン19の構成を示す外観図であり、例えばインクジェットプリンタエンジンの場合を示す。

【0014】図において、駆動モータ5013の正逆回転に連動して駆動力伝達ギア5011、5009を介して回転するリードスクリュー5005の螺旋溝5004に対して係合するキャリッジHCはピン(図示しない)を有し、ガイドレール5003を介して矢印a、b方向に往復移動される。このキャリッジHCには、インクタンクITとインクジェットヘッドIJHとを備えたインクジェットカートリッジIJCが搭載されている。5002は紙押え板であり、キャリッジ移動方向にわたって紙をプラテン5000に対して押圧する。

【0015】5007、5008はフォトカブラで、キャリッジのレバー5006のこの域での存在を確認して、駆動モータ5013の回転方向切り換え等を行うためのホームポジション検知手段として機能する。5016は記録ヘッドの全面をキャップするキャップ部材5022を指示する部材、5015はこのキャップ内を吸引する吸引手段で、キャップ内開口5023を介して記録ヘッドの吸引回復を行う。5017はクリーニングブレードで、部材5019により前後方向に移動可能となる。5018は本体支持板で、上記クリーニングブレード5017、部材5019を支持する。5012は吸引回復の吸引を開始するためのレバーで、キャリッジと係合するカム5020の移動に伴って移動し、駆動モータ5013からの駆動力がクラッチ切り換え等の公知の伝達手段で移動制御される。

【0016】これらのキャッピング、クリーニング、吸

引回復は、キャリッジがホームポジション側領域にきたときにリードスクリュー5005の作用によってそれらの対応位置で所望の処理が行えるように構成されているが、周知のタイミングで所望動作を行うように構成されていれよい。

【0017】図1に示す各部の構成を詳述すると、システムにおける情報処理装置として設けられたホストコンピュータ1は、ハードディスク8内のオペレーティングシステムに基づいてアプリケーションプログラム等によって生成された文字/図形/イメージの混在するデータをハードディスク8内のプリンタ制御プログラム(プリンタドライバ)を介してプリンタ2へ画像データを出力する機能や、ハードディスク8内のオペレーティングシステム(OS)に基づいてプリンタ状態表示プログラム(ステータスマニタ)を介してプリンタ2の状態情報をCRTコントローラ13を介してCRT5に表示する機能などを有する。

【0018】なお、プリンタドライバには、プリンタ2へイメージデータを送るためのプリンタドライバやプリンタ2へページ記述言語を送るためのプリンタドライバがある。

【0019】キーボード3は、各種キーを備えており、データを入力するためのものである。CRT5は、例えば図9や図10に示す様な各種情報を表示する。尚、表示手段はCRTに限定されず、例えば液晶等の他の表示手段でもよい。CPU6は、各種プログラムに基づきホストコンピュータ本体3の制御を行う。RAM7は、随時書き込み読み出しメモリであり、ホストコンピュータ1内部で動作する全てのプログラムがロードされたり、プログラムの動作中にワークメモリとして使用される。ハードディスク8は、アプリケーションプログラム、プリンタ制御プログラム(プリンタドライバ)、プリンタ状態表示プログラム(ステータスマニタ)等の各種プログラムの他に、各種プログラムが動作する際に必要なデータ等が格納されている。ハードディスクコントローラ9は、ハードディスク8に格納されたデータやプログラムの読み出し/書き込み処理を行う。

【0020】データ入出力コントローラ10は、双方向のデータ通信インタフェース(例えば、IEEE1284規格のバイセントロインタフェース)によってプリンタ2と接続されており、プリンタ2との間で後述するコマンドやデータの送受信を行うことにより、上記プリンタ制御プログラムで生成されたプリンタ制御用コマンドやデータをプリンタ2側へ転送したり、逆にプリンタ2側から送られてきたステータス等のデータを受信して不図示の内部メモリに一時的に保持する。ROM11は、読み出し専用メモリであり、ホストコンピュータ1上で各種プログラムを実行したり、各種コントローラの制御を行うなどの様々な基本動作のためのプログラムを格納するプログラムROM及びデータを格納するデータRO



Mの他に、CRT 5上に各種情報を表示する際に用いるフォントデータ等を格納するフォントROM等から構成される。キーボードコントローラ12は、ホストコンピュータ1に接続されたキーボード4からのキー入力を制御する。CRTコントローラ13は、ディスプレイ用のCRT 5への表示を制御する。

【0021】プリンタ2は、ホストコンピュータ1から送信されてきたイメージデータを受信すると共に、受信したイメージデータを記録用紙上に記録し、また、ホストコンピュータ1からプリンタ状態の送信を要求するコマンドを受信すると共に、受信したコマンドに応じてプリンタ状態データ（ステータス）をホストコンピュータ1に対して送信する。データ入出力コントローラ14は、プリンタ2に対してホストコンピュータ1から転送されたイメージデータ等を受信したり、プリンタ2側からのステータスをホストコンピュータ1へ転送する。CPU 15は、プリンタ本体の制御を行う。プログラムROM 16は、ホストコンピュータ1から受信したイメージデータをプリンタエンジン19で記録させる一連のプリンタ動作を行うためのプログラムが格納されている。

【0022】なお、ホストコンピュータ1からページ記述言語の様なプリンタ言語を受信した場合に、当該プリンタ言語を解析してイメージデータを生成するエミュレーションプログラムも格納されている。

【0023】フレームメモリ17は、プログラムROM 16内のエミュレーションプログラムによって生成された或いは受信したイメージデータを保持するメモリである。ワークメモリ18は、イメージデータの生成処理を始めとして画像記録の各種処理において使用されるメモリである。プリンタエンジン19は、フレームメモリ17に保持したイメージデータを記録用紙上に例えばカラーで記録するものであり、当該プリンタエンジン19で記録できる画像は2値の記録パターンである。

【0024】更に、上記構成を有するプリンタ2は、当該プリンタ2の動作状態やエラー状態等のステータス情報獲得コマンドをサポートしており、当該コマンドを受信した際には、プリンタ2の動作状態が印字中であるのか、排紙中であるのか、そのいずれでもないのか、エラーが発生しているのかを判定すると共に、エラーが発生している場合には当該エラーに対応して予め設定されたエラーコードを転送するものである。エラー発生時に転送するエラーコードのデータフォーマットは、例えば図4に示すようなプリンタステータス情報となる。

【0025】第1の実施の形態では、ホストコンピュータ1のデータ入出力コントローラ10は、プリンタ2に対してステータス情報獲得コマンドを送信するコマンド送信手段を構成すると共に、プリンタ2から転送されたプリンタ2の動作状態やエラー状態等を表すステータス情報を受信するステータス情報受信手段を構成し、ホストコンピュータ1のCPU 6は、前記ステータス情報か

らプリンタ2の状態に応じてステータス情報獲得コマンドをプリンタ2に対して発行する時間間隔を制御する制御手段を構成している。

【0026】次に、図2のフローチャートに示すプリンタ状態表示プログラム（ステータスマニタ）の動作を説明する。

【0027】まず、CPU 6はホストコンピュータ1がプリンタ2に対してステータス情報獲得コマンドを転送する時間間隔の初期値を例えば、1.0秒に決定し、ホストコンピュータ1のRAM 7内に設けられたステータス獲得間隔記録領域に当該初期値を格納する（ステップS101）。次に、CPU 6はホストコンピュータ1のCRT 5上に、ステータス表示領域を設定する（ステップS102）。当該ステータス表示領域には、図9や図10に示すようにプリンタ2の動作状況及びエラー状況が文字列やビットマップ画像を用いて表示される。

【0028】次に、CPU 6は利用者がプリンタ状態表示プログラムの終了を要求しているか否かを判定し（ステップS103）、プログラムの終了を要求していると判断した場合は、プログラムを終了する。他方、プログラムの終了を要求していないと判断した場合は、CPU 6は前回プリンタ2に対してステータス獲得コマンドを転送してからRAM 7内のステータス獲得間隔記録領域に格納されている時間（例えば1秒）が経過したか否かを判定し（ステップS104）、経過したと判断した場合は、ステータス表示処理を行い（ステップS105）、ステップS103以下の処理を繰り返す。他方、前回プリンタ2に対してステータス獲得コマンドを転送してからRAM 7内のステータス獲得間隔記録領域に格納されている時間（2秒）が経過していないと判断した場合は、ステップS103以下の処理を繰り返す。

【0029】なお、当該プリンタ状態表示プログラムの開始に伴って不図示のタイマーが起動される。そして、前回ステータス獲得コマンドを転送していない場合には、ステップS104でプログラム開始から上記時間（1秒）が経過したか否かを判断する。

【0030】上記のように、本実施の形態に係る情報処理装置内のCPU 6は、ステップS101及びステップS103の処理を終了した後は、利用者のプログラム終了要求があるまで、ステップS103とステップS105との間を繰り返し実行するようになっている。

【0031】次に、上記図2にステップS105として示したステータス表示処理の動作を図3のフローチャートに基づき説明する。

【0032】まず、ホストコンピュータ1のCPU 6はプリンタ2の動作状態とエラー状態とを調べるべく、プリンタ2のサポートするステータス情報獲得コマンドをプリンタ2へ転送する（ステップS201）。次に、ホストコンピュータ1のCPU 6はプリンタ2から転送されたステータス情報を受信して読み込む（ステップS2

02)。当該ステータス情報には、図4に示した如くプリンタ2の動作状態とエラー状態の情報が含まれており、この値を以降で使用する。

【0033】尚、図4の動作状態のフィールドには、給紙中(LD)、印刷中(PR)、排紙中(EJ)、待機中(NO)の4種類の動作状態を表す2バイトの文字列が格納されており、エラー状態のフィールドには、プリンタ2で発生しているエラーの種類を表すプリンタ2固有の4バイトで表されるエラーコードか又はエラーが発生していないことを表す4バイト下のコードが格納されている。例えば、用紙なしの場合は1000が、ジャム発生の場合は1300が格納されている。

【0034】ホストコンピュータ1のCPU6は上記ステップS202でステータスデータを受信してRAM7のワークメモリに格納すると、上記ステップS202でプリンタ2から受信したステータスデータが現在ホストコンピュータ1のCRT5上に表示しているプリンタ2の状態を示すステータスデータから変化しているか否かを判定する(ステップS203)。当該判定は、ステータスに変化が無い場合は以後のステータス表示の変更等の処理を行わないようにするために実行する。プリンタ2から受信したステータスデータが現在ホストコンピュータ1のCRT5上に表示しているプリンタ2の状態を示すステータスデータと同じであると判断した場合は、ステータス表示処理を中断して上記図1のステップS103へ移行する。

【0035】なお、CRT5上に表示しているプリンタ2の状態を示すステータスデータはRAM7のワークメモリに格納されており、このステータスデータと受信したステータスデータとをステップS203で比較して変化したか否かを判断する。

【0036】ホストコンピュータ1は受信したプリンタ2のステータスデータとCRT5に表示している内容を示すステータスデータとが異なると判断した場合は、プリンタ2が印刷動作中であるか待機中であるかを知らべく、プリンタ2から受信したステータスデータの動作状態フィールドの内容が、プリンタ2が給紙/印刷/排紙のいずれかの動作を行っていることを表しているか否かを判定する(ステップS204)。

【0037】動作状態フィールドの内容が給紙中(LD)、印刷中(PR)、排紙中(EJ)のいずれかを表している場合は、ホストコンピュータ1のRAM7内のステータス取得間隔記録領域の内容を、図5に示すステータス取得間隔データの設定値1の値(例えば、0.5秒)に変更し(ステップS205)、ステップS207へ移行する。他方、動作状態フィールドの内容が待機中(NO)を表している場合は、ホストコンピュータ1のRAM7内のステータス取得間隔記録領域の内容を、図5に示すステータス取得間隔データの設定値2の値(例えば2.0秒)に変更し(ステップS206)、ステッ

プS207へ移行する。

【0038】なお、図5に示すフィールドは、RAM7のワークメモリに予め格納されている。

【0039】ここで、図5の設定値1の値は設定値2の値よりも小さく設定されており、プリンタ2が動作中で頻繁にプリンタ2のステータスが変化する場合、それに合わせてホストコンピュータ1が短い時間間隔でプリンタ2のステータス情報を取得するようになっている。また、プリンタ2が待機中でステータスの変化が動作中の場合ほど頻繁でない場合は、ホストコンピュータ1がプリンタ2からステータス情報を取得する時間間隔を長くすることにより、ホストコンピュータ1及びプリンタ2のパフォーマンスを損なわないように制御する。

【0040】上記ステップS205またはステップS206の処理が終了すると、ホストコンピュータ1は上記ステップS202でプリンタ2から受信した内容をCRT5上に表示する(ステップS207)。この後、上記図1のステップS103へ戻る。例えば、受信したステータスが印刷中であれば図9に示す内容をステップS207でCRT5に表示する。また、受信したステータスが待機中であれば図10に示す内容をステップS207でCRT5に表示する。

【0041】上述したように、第1の実施の形態によれば、ホストコンピュータ1が当該ホストコンピュータ1に接続されたプリンタ2に対してステータス情報獲得コマンドを送信してプリンタ2からステータス情報を受信し、その内容をプリンタ2の動作状態やエラー状態としてCRT5へ表示する場合に、ホストコンピュータ1がプリンタ2に対してステータス情報獲得コマンドを送信してその応答を受信するという一連の動作を繰り返す際の時間間隔(ポーリングインターバル)を、プリンタ2が給紙、印刷、排紙という動作を行っているか或いは待機中であるかを基準にして、プリンタ2が動作中であれば予め設定された短い時間間隔に設定し、また、プリンタ2が待機中であれば予め設定された長い時間間隔に設定するため、プリンタ2が動作中でステータスが頻繁に変化する場合には、それに合わせて短い時間間隔でステータス表示を更新することが可能となり、また、プリンタ2が待機中でステータスの変化が比較的少ない場合には、ステータス表示を更新する頻度を小さくすることが可能となり、この結果、ホストコンピュータ1及びプリンタ2のパフォーマンスを損なわないように制御することが可能となる。

【0042】(2) 第2の実施の形態

上記第1の実施の形態ではホストコンピュータ1がステータス情報獲得コマンドをプリンタ2に対して転送し、これに対するプリンタ2の応答であるステータス情報をプリンタ2から受信するという一連の動作を繰り返す時間間隔を、プリンタ2が給紙、印刷、排紙という動作を行っているか否かを基準にして変化させる制御を行って

いるが、本第2の実施の形態は、これに加えて、プリンタ2でエラーが発生した場合に、ホストコンピュータ1がプリンタ2に対してステータス情報獲得コマンドを転送し、その応答であるステータス情報を受信するという一連の動作を繰り返す時間間隔を、エラーが発生していない場合よりも短く設定して、CRT5上のステータス表示を短い時間間隔で更新することで、利用者がプリンタ2のエラーに速やかに対処できるようにしたものである。

【0043】第2の実施の形態に係るシステム構成は上記第1の実施の形態に係るシステム構成と同様であり、第2の実施の形態が上記第1の実施の形態と相異なる点は、上記図2のフローチャートにステップS105として示したステータス表示処理を図6のフローチャートが示すように行う点である。

【0044】図6において、ホストコンピュータ1のCPU6はプリンタ2の動作状態とエラー状態とを調べるべく、プリンタ2のサポートするステータス情報獲得コマンドをプリンタ2へ転送する（ステップS301）。次に、ホストコンピュータ1のCPU6はプリンタ2から転送されたステータス情報を受信して読み込む（ステップS302）。当該ステータス情報には、上記図4に示した如くプリンタ2の動作状態とエラー状態の情報が含まれており、この値を以降で使用する。

【0045】ホストコンピュータ1のCPU6は上記ステップS302でステータスデータをRAM7のワークメモリ格納すると、上記ステップS302でプリンタ2から受信したステータスデータが、現在ホストコンピュータ1のCRT5上に表示しているプリンタ2の状態を示すステータスデータから変化しているか否かを判定する（ステップS303）。当該判定は、ステータスに変化が無い場合は以後のステータス表示の変更等の処理を行わないようにするために実行する。

【0046】なお、CRT5に表示しているプリンタ2の状態を示すステータスデータはRAM7のワークメモリに格納されており、このステータスデータと受信したステータスデータとをステップS303で比較して変化したか否かを判断する。

【0047】ホストコンピュータ1のCPU6はプリンタ2がエラー状態であるか否かを調べるべく、プリンタ2から受信したステータスデータのエラー状態フィールドの内容が、エラーが発生していることを表す数値かエラーが発生していないことを表す数値かを判定する（ステップS304）。ステータスデータのエラー状態フィールドの内容がプリンタ2のエラーを表していると判断した場合は、先ず、ホストコンピュータ1のRAM7に設けたエラー発生時刻記憶領域に不図示のタイマーの現在時刻を設定し（ステップS305）、例えば図7に示すようなステータス取得間隔テーブルの第一列を選択し、その第一行の内容を上記図5に示したステータス取得間

隔データの設定値1のフィールドにセットすると共に、その第二行の内容をステータス取得間隔データの設定値2のフィールドにセットし（ステップS306）、ステップS309へ移行する。

【0048】他方、ホストコンピュータ1のCPU6はステータスデータのエラー状態フィールドの内容がプリンタ2のエラーを表していないと判断した場合は、先ず、ステップS305で設けたエラー発生時刻記憶領域の記憶値と現在時刻とを比較して、エラー発生時刻記憶領域に設定された時刻からホストコンピュータ1のRAM7に設けられた規定時間記憶領域に記憶された規定時間（例えば、10秒）が経過しているか否かを判定する（ステップS307）。既に規定時間が経過していると判断した場合は、上記図7に示したステータス取得間隔テーブルの第二列を選択し、その第一行の内容を上記図5に示したステータス取得間隔データの設定値1のフィールドにセットすると共に、その第二行の内容をステータス取得間隔データの設定値2のフィールドにセットし（ステップS306）、ステップS309へ移行する。まだ規定時間が経過していないと判断した場合は、直接ステップS309へ移行する。

【0049】なお、一度もエラーが発生していない場合には、ステップS307でCPU6は、プリンタ状態表示プログラムの開始時刻から規定時間が経過したか否かを判断する。

【0050】ここで、上記図7のステータス取得間隔テーブルは、ホストコンピュータ1のRAM7に設けられたステータス取得間隔テーブル記憶領域にあり、プリンタ2でエラーが発生している場合とエラーが発生していない場合のそれぞれについて、プリンタ2が動作中と待機中のそれぞれの場合のステータス取得間隔を記憶する領域である。ステータス取得間隔テーブルに記憶されたステータス取得間隔を図7に示した如くT1（例えば、0.5秒）、T2（例えば、1.0秒）、T3（例えば、1.0秒）、T4（例えば、2.0秒）とすると、T1はT2よりも小さく、T3はT4よりも小さく、T1はT3よりも小さく、T2はT4よりも小さくなるように予め設定されているものとする。

【0051】上記ステップS306またはステップS308またはステップS307の処理が終了すると、ホストコンピュータ1は上記ステップS302でプリンタ2から受信した当該プリンタ2のステータスデータの動作状態フィールドを参照して、プリンタ2が給紙、印刷、排紙のいずれかの動作を行っているか或いは待機しているかを判定する（ステップS309）。

【0052】プリンタ2が動作中であると判断した場合は、ホストコンピュータ1のRAM7内のステータス獲得間隔記録領域の内容を、ステータス取得間隔データの設定値1の値に変更し（ステップS310）、ステップS312へ移行する。他方、プリンタ2が待機中である

と判断した場合は、ホストコンピュータ 1 の RAM 7 内のステータス獲得間隔記録領域の内容を、ステータス取得間隔データの設定値 2 の値に変更し（ステップ S 3 1 1）、ステップ S 3 1 2 へ移行する。

【0053】即ち、プリンタ 2 でエラーが発生している場合は、エラーが発生していない場合よりもステータス表示を更新するための処理を行う時間間隔が短くなり、また、プリンタ 2 が給紙、印刷、排紙の動作を行っている場合は、動作を行っていない場合よりもステータス表示を更新するための処理を行う時間間隔が短くなることになる。

【0054】上記ステップ S 3 1 0 またはステップ S 3 1 1 の処理が終了すると、ホストコンピュータ 1 は上記ステップ S 3 0 2 でプリンタ 2 から受信した内容を、ホストコンピュータ 1 の CRT 5 上に表示し（ステップ S 3 1 2）、その後、上記図 1 のステップ S 1 0 3 へ戻る。例えば、受信したステータスがジャム発生中であれば図 1 1 に示す内容を S 3 1 2 で CRT 5 に表示する。

【0055】上述したように、第 2 の実施の形態によれば、ホストコンピュータ 1 はプリンタ 2 にエラーが発生しているか否かを判定すると共にプリンタ 2 にエラーが発生していると判断した場合は、プリンタ 2 に対してステータス情報獲得コマンドを送信してその応答を受信するという一連の動作を繰り返す際の時間間隔（ポーリングインターバル）を、エラーが発生していない場合よりも短く設定するため、プリンタ 2 のエラー発生時にはステータス表示を更新する時間を短くし、利用者がプリンタ 2 のエラーに速やかに対処することができるようになる。例えば、ジャム発生の場合には、図 1 1 の表示内容に従って利用者がエラーに速やかに対処できる。また、プリンタ 2 のエラーが解消された場合でも、エラー発生時から一定時間が経過するまでステータス情報を取得する時間間隔を短くし続けるため、利用者がエラーに対して正しい対処を行わずに、一時的にエラー状態が解消された後、すぐにエラーが再発するような場合にも、速やかにステータス表示を行って利用者へエラーに対処することを促すことができる。

【0056】尚、本発明は、複数の機器から構成されるシステムに適用しても、1 つの機器からなる装置に適用しても良い。また、本発明は、システム或は装置にプログラムを供給することによって達成される場合にも適用できることは言うまでもない。この場合、本発明を達成するためのソフトウェアによって表されるプログラムを格納した記憶媒体を該システム或は装置に読み出すことによって、そのシステム或は装置が、本発明の効果を享受することが可能となる。

【0057】次に、本実施形態の情報処理装置で使用される例えばハードディスク 8 の様な記憶媒体について、図 1 2 を用いて説明する。

【0058】図 1 2 は、本発明の各実施形態におけるプ

リント状態表示プログラム（ステータスマニタ）を記憶した記憶媒体のメモリマップである。

【0059】双方向インタフェースを介してプリンタを制御する情報処理装置で使用され、前記プリンタのステータスに応じて、ステータスデータの要求コマンドをプリンタへ送信する時間間隔を制御する制御プログラムを格納する記憶媒体には、図 1 2 に示すように、少なくとも「認識モジュール」、「制御モジュール」のプログラムコードを記憶媒体に格納すれば良い。

【0060】ここで、「認識モジュール」は、プリンタから取得したステータスデータに基づいてプリンタのステータスを認識する為のプログラムモジュールである。

【0061】また、「制御モジュール」は、認識モジュールで認識したプリンタのステータスに応じて、ステータスデータの要求コマンドをプリンタへ送信する時間間隔を制御する為のプログラムモジュールである。

【0062】なお、記憶媒体としては本実施形態のハードディスク 8 の他に、ホストコンピュータ本体 3 等の情報処理装置に着脱可能なフロッピーディスク、光ディスク、光磁気ディスク、CD-ROM、不揮発性メモリーカードなどを用いることができる。

【0063】

【発明の効果】以上説明したように本発明によれば、プリンタから取得したステータスデータに基づいてプリンタのステータスを認識し、当該認識したプリンタのステータスに応じて、ステータスデータの要求コマンドをプリンタへ送信する時間間隔を制御することで、プリンタの状態変化とホストコンピュータ等の情報処理装置で表示されるプリンタの状態情報との時間差を軽できると共に、プリンタ及び情報処理装置のパフォーマンスの悪化を回避できる。

【0064】例えば、ステータスデータがプリンタ動作中を示す場合には、当該送信時間間隔を短くすることで、頻繁に変化するステータスに合わせて短い時間間隔でステータス表示を更新することができる。

【0065】また、ステータスデータがプリンタ待機中を示す場合には、当該送信時間間隔を長くすることで、比較的变化の少ないステータスに応じてステータス表示の更新頻度を小さくすることができる。

【0066】また、ステータスデータがプリンタエラーを示す場合には、当該送信時間間隔を短くすることで、頻繁に変化するステータスに合わせて短い時間間隔でステータス表示を更新でき、利用者がプリンタのエラーに速やかに対処することができる。

【0067】また、ステータスデータがプリンタエラー及びプリンタ動作中を示す場合には、当該送信時間間隔を最も短くすることで、頻繁に変化するステータスに合わせて最も短い時間間隔でステータス表示を更新でき、利用者がプリンタのエラーに速やかに対処することができる。

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【0068】また、ステータスデータがプリンタ正常及びプリンタ待機中を示す場合には、当該送信時間間隔を最も長くすることで、比較的变化の少ないステータスに応じてステータス表示の更新頻度を最も小さくすることができる。

#### 【図面の簡単な説明】

【図1】本発明の第1及び第2の実施の形態に係るホストコンピュータ及びプリンタからなるシステムの構成を示すブロック図である。

【図2】第1及び第2の実施の形態に係る処理動作を示すフローチャートである。

【図3】第1の実施の形態に係るステータス表示処理の処理動作を示すフローチャートである。

【図4】第1及び第2の実施の形態に係るプリンタステータスデータのデータフォーマットを示す説明図である。

【図5】第1及び第2の実施の形態に係るステータス取

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得間隔データのデータフォーマットを示す説明図である。

【図6】第2の実施の形態に係るステータス表示処理の処理動作を示すフローチャートである。

【図7】第2の実施の形態に係るステータス取得間隔データのデータフォーマットを示す説明図である。

【図8】本発明の第1及び第2の実施の形態に係るプリンタのプリンタエンジンの外観図である。

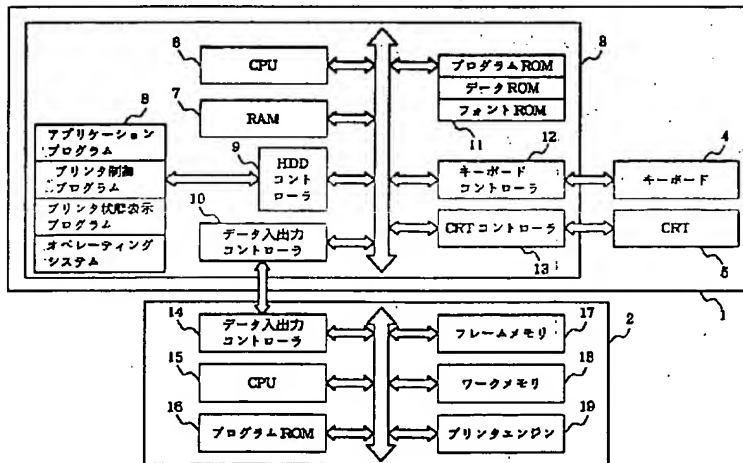
【図9】本発明の第1及び第2の実施の形態に係るプリンタ印刷中のステータス表示内容を示す図である。

【図10】本発明の第1及び第2の実施の形態に係るプリンタ待機中のステータス表示内容を示す図である。

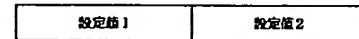
【図11】本発明の第2の実施の形態に係るプリンタジャム発生中のステータス表示内容を示す図である。

【図12】本発明の第1及び第2の実施の形態に係るプリンタ状態表示プログラムを記憶した記憶媒体のメモリマップである。

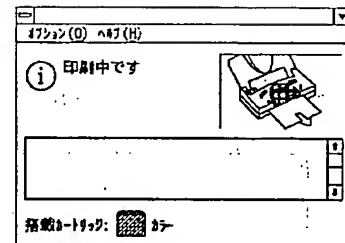
【図1】



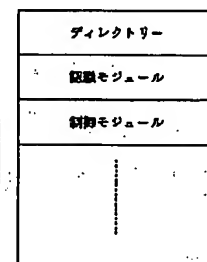
【図5】



【図9】



【図12】



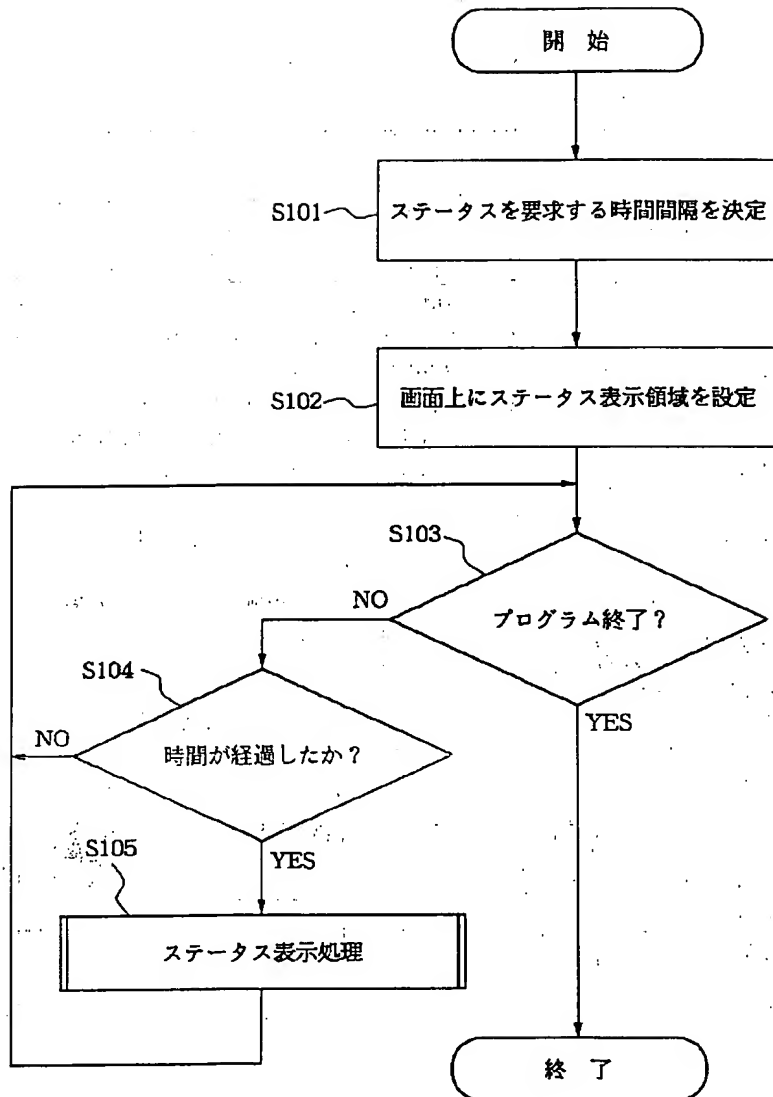
【図4】

2バイト	4バイト
動作状態情報	エラー状態情報

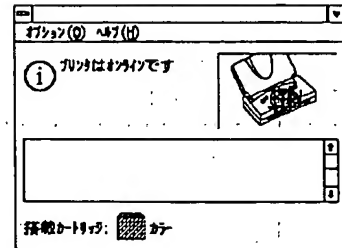
【図7】

	第一列 (エラー時)	第二列 (正常時)
第一行 (動作中)	T1	T3
第二行 (待機中)	T2	T4

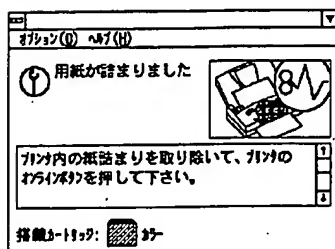
【図2】



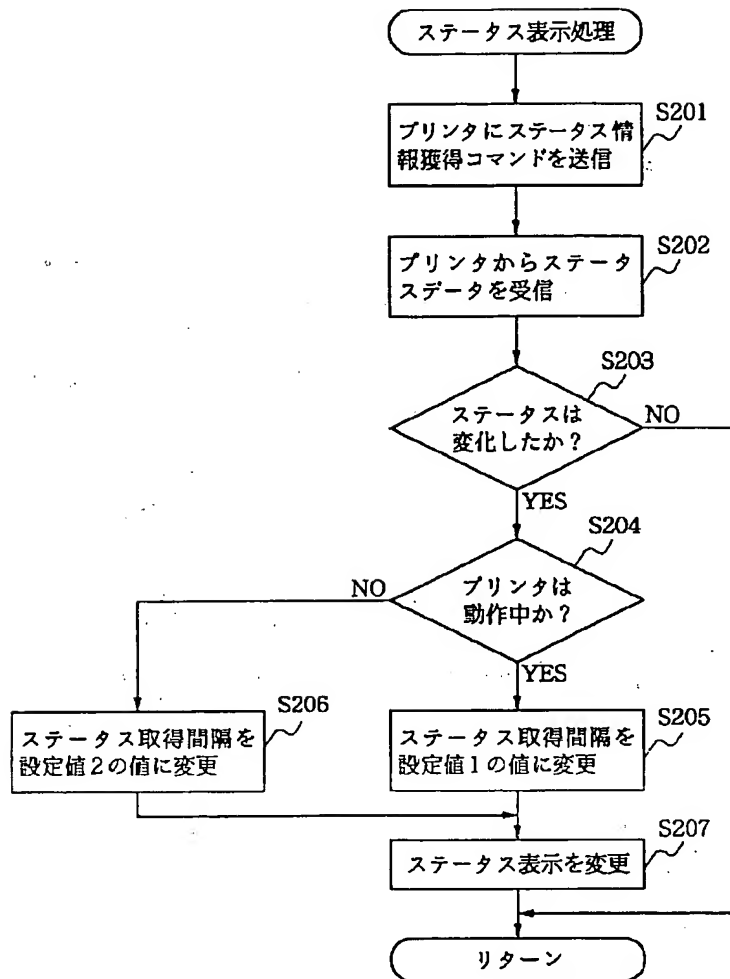
【図10】



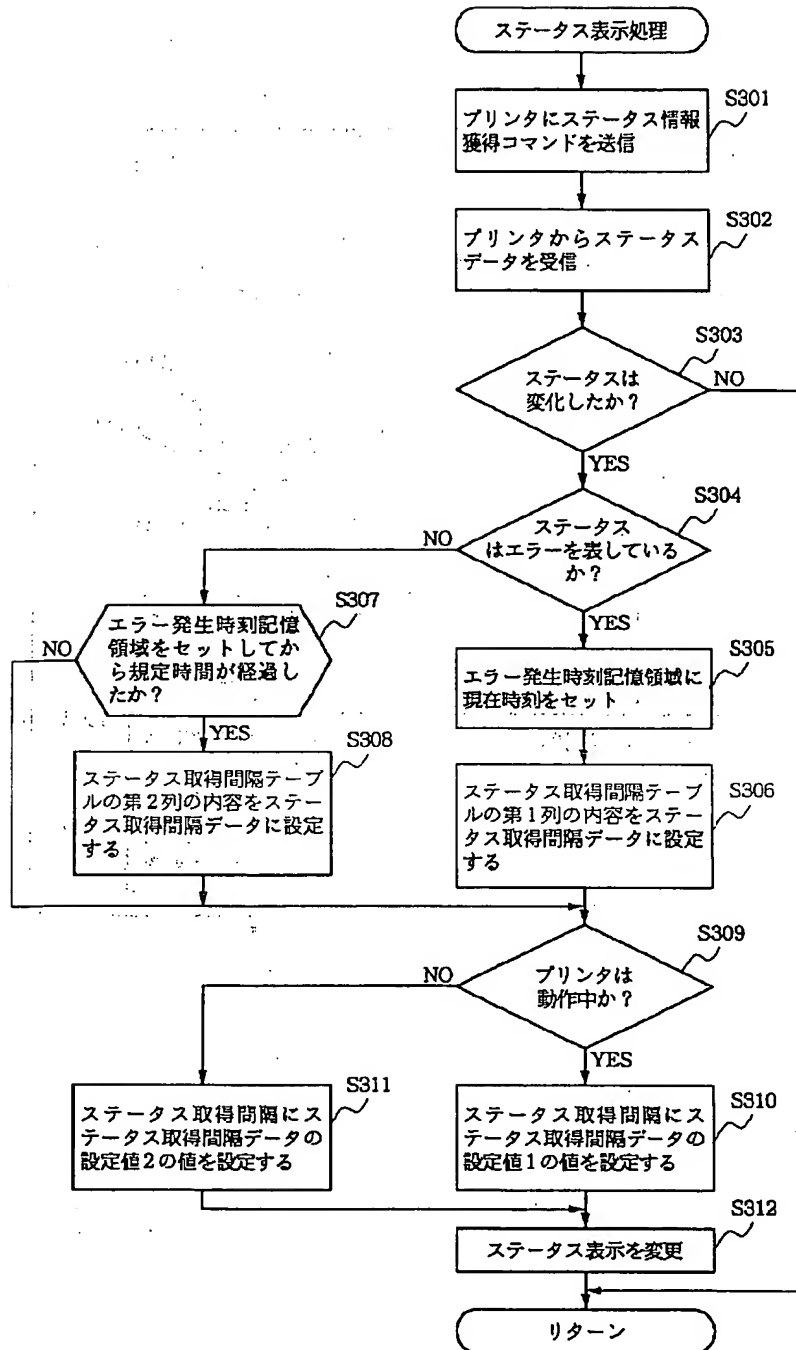
【図11】



【図3】



【図6】







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【手続補正書】

【提出日】 平成 14 年 7 月 4 日 (2002. 7. 4)

【手続補正 1】

【補正対象書類名】 明細書

【補正対象項目名】 特許請求の範囲

【補正方法】 変更

【補正内容】

【特許請求の範囲】

【請求項 1】 双方向インタフェースを介してプリンタとの間でデータ又はコマンドの送受信が可能な情報処理装置であって、

前記プリンタから取得したステータスデータに基づいて前記プリンタのステータスを認識する認識手段と、前記認識手段で認識したステータスに応じて、前記ステータスデータを要求する要求コマンドを前記プリンタへ送信する時間間隔を制御する制御手段とを有することを特徴とする情報処理装置。

【請求項 2】 前記制御手段は、前記ステータスデータが動作中を示す場合には、前記時間間隔を短くすることを特徴とする請求項 1 に記載の情報処理装置。

【請求項 3】 前記制御手段は、前記ステータスデータが待機中を示す場合には、前記時間間隔を長くすることを特徴とする請求項 1 或いは 2 に記載の情報処理装置。

【請求項 4】 前記制御手段は、前記ステータスデータがエラーを示す場合には、前記時間間隔を短くすることを特徴とする請求項 1 乃至 3 のいずれかに記載の情報処理装置。

【請求項 5】 双方向インタフェースを介してプリンタを制御するプリンタ制御方法であって、前記プリンタから取得したステータスデータに基づいて前記プリンタのステータスを認識する認識ステップと、前記認識ステップで認識したステータスに応じて、前記ステータスデータを要求する要求コマンドを前記プリン

タへ送信する時間間隔を制御する制御ステップとを有することを特徴とするプリンタ制御方法。

【請求項 6】 前記制御ステップでは、前記ステータスデータが動作中を示す場合には、前記時間間隔を短くすることを特徴とする請求項 5 に記載のプリンタ制御方法。

【請求項 7】 前記制御ステップでは、前記ステータスデータが待機中を示す場合には、前記時間間隔を長くすることを特徴とする請求項 5 或いは 6 に記載のプリンタ制御方法。

【請求項 8】 前記制御ステップでは、前記ステータスデータがエラーを示す場合には、前記時間間隔を短くすることを特徴とする請求項 5 乃至 7 のいずれかに記載のプリンタ制御方法。

【請求項 9】 前記制御ステップでは、前記前記ステータスデータがエラー及び動作中を示す場合には、前記時間間隔を最も短くすることを特徴とする請求項 5 乃至 8 のいずれかに記載のプリンタ制御方法。

【請求項 10】 前記制御ステップでは、前記ステータスデータが正常及び待機中を示す場合には、前記時間間隔を最も長くすることを特徴とする請求項 5 乃至 9 のいずれかに記載のプリンタ制御方法。

【請求項 11】 前記制御ステップで制御された時間間隔に従って、前記要求コマンドを送信する送信ステップと、

前記ステータスデータを受信する受信ステップとを有することを特徴とする請求項 5 乃至 10 のいずれかに記載のプリンタ制御方法。

【請求項 12】 前記ステータスデータに基づいて、前記プリンタのステータスを表示する表示ステップを有することを特徴とする請求項 5 乃至 11 のいずれかに記載のプリンタ制御方法。

【請求項13】 前記ステータスデータがエラーを示す場合、現在時刻をエラー発生時刻記憶領域に設定する設定ステップを有し、  
前記制御ステップは、前記ステータスデータがエラーを示していない、前記エラー発生時刻記憶領域に設定された前記現在時刻から規定時間が経過している場合、前記認識ステップで認識したステータスに応じて、前記時間間隔を制御することを特徴とする請求項1乃至12のいずれかに記載のプリンタ制御方法。

【手続補正2】

【補正対象書類名】明細書

【補正対象項目名】0008

【補正方法】変更

【補正内容】

【0008】

【課題を解決するための手段】上記課題を解決するために、本発明に係る情報処理装置は、双方向インタフェースを介してプリンタとの間でデータ又はコマンドの送受信が可能な情報処理装置であって、前記プリンタから取得したステータスデータに基づいて前記プリンタのステータスを認識する認識手段と、前記認識手段で認識したステータスに応じて、前記ステータスデータを要求する要求コマンドを前記プリンタへ送信する時間間隔を制御する制御手段とを有することを特徴とする。

【手続補正3】

【補正対象書類名】明細書

【補正対象項目名】0009

【補正方法】変更

【補正内容】

【0009】また、本発明に係るプリンタ制御方法は、双方向インタフェースを介してプリンタを制御するプリンタ制御方法であって、前記プリンタから取得したステ

ータスデータに基づいて前記プリンタのステータスを認識する認識ステップと、前記認識ステップで認識したステータスに応じて、前記ステータスデータを要求する要求コマンドを前記プリンタへ送信する時間間隔を制御する制御ステップとを有することを特徴とする。

【手続補正4】

【補正対象書類名】明細書

【補正対象項目名】0010

【補正方法】変更

【補正内容】

【0010】さらに、本発明に係るプリンタ制御方法における制御ステップでは、前記ステータスデータが動作中を示す場合には、前記時間間隔を短くする、または、前記ステータスデータがタ待機中を示す場合には、前記時間間隔を長くする、または、前記ステータスデータがエラーを示す場合には、前記時間間隔を短くする、または、前記前記ステータスデータがエラー及び動作中を示す場合には、前記時間間隔を最も短くすることを特徴とする。

【手続補正5】

【補正対象書類名】明細書

【補正対象項目名】0064

【補正方法】変更

【補正内容】

【0064】以上説明したように、本発明によれば、プリンタから取得したステータスデータに基づいてプリンタのステータスを認識し、認識したステータスに応じて、ステータスデータを要求する要求コマンドをプリンタへ送信する時間間隔を制御することにより、プリンタの状態が変化してから、情報処理装置にプリンタの状態情報が表示されるまでの間の時間差を少なくできる。

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